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British Medical Journal

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ANCIENT EGYPTIAN WOMEN PLAYING A GAME OF BALL.—Stimulated by the energetic XIth and XIIth dynasty pioneers of civilisation, life became rich and varied in Egypt. Not only occupations and industries, but many kinds of amusements are depicted upon the monuments of this time. From one of them comes the scene reproduced below. Considerable skill is shown by the players; perhaps they were professional dancers giving an exhibition, since ball-throwing appears to have been considered a branch of dancing. Sometimes two, three, or more balls were thrown and caught in succession; one player is depicted performing the feat with her arms crossed. At other times the game was that one party should toss the ball as high in the air as possible, while the members of the opposing party, leaping high, caught it before their feet touched the ground. Two players are seen mounted upon the backs of their fellows, the latter, no doubt, being those who have failed to catch the ball—as, later, in a Greek game. These would suffer their position until the mounted person missed.

Balls were made of skin or leather, stuffed with bran or husks and stitched together; others were made of plaited rush stalks, formed into a round mass and covered with leather. Examples of both kinds may be seen in the British Museum.

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Observations
ON
THE SIGNIFICANCE OF RETINAL HAEMORRHAGES.*

BY
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As, in a generous but perhaps unduly sanguine mood, the Master of the Congress and his colleagues have placed in my hands the responsibility of opening this discussion, I must conclude that in their judgement it will be an advantage to have a statement of the problems affirmed by the existence of retinal haemorrhages as these present themselves in the practice of a physician. The issue arises in two different circumstances: (1) when, in consequence of the discovery of one or more haemorrhages in the retina, there appears the question whether these are of purely local significance or whether, on the contrary, the haemorrhage is an announcement of some diseased condition either affecting the body generally or situated in some more or less remote organ; and (2) when, the patient's health being in one fashion or another admittedly unsatisfactory, the recognition of retinal haemorrhage imposes itself as an additional fact, and one that demands consideration in the discussion of the diagnostic and prognostic aspects of the case. In the one instance the question is, Is there, in addition to the retinal haemorrhage, any other evidence of disease, and if so, what is the relation between the two observations? In the other, What aid or influence does the retinal haemorrhage contribute to the clinical interpretation of the facts taken as a whole? Both in the one position and in the other it is obvious that a retinal haemorrhage in its clinical meaning can be judged only when all the facts—positive and negative—relative to the individual patient have been duly collected and studied; in other words, it is a claim for nothing less than a complete and thorough clinical examination. Not that in this respect retinal haemorrhage stands in a peculiar or exceptional position. On the contrary, it comes under the general rule that, important as an examination of individual organs may be, still more important is the examination of the patient.

The first question in our discussion must necessarily be, May retinal haemorrhage exist without clinical significance? The answer, I think, must be in the affirmative. That is, routine ophthalmoscopic examination now and again discovers retinal haemorrhage in quite exceptional circumstances; and the circumstances are so various, and the event itself so occasional, that it seems impossible to attach to such haemorrhages any precise meaning and value. In my own notes I find records of retinal haemorrhages—few in number and slight in degree—in individual cases of pneumonia, pyonephrosis, malignant disease of the viscera, mitral disease, and ill-defined clinical conditions that had to be content with such an unsatisfactory label as "anaemia." As the routine use of the ophthalmoscope becomes more general under the influence of the conviction that inspection of the fundus oculi is an essential part of every complete clinical examination, it may be anticipated that unexpected retinal haemorrhages in various circumstances will be a more familiar experience.

In a second group of retinal haemorrhages the significance is obvious. I refer to haemorrhages due to violence. Of the consequences of direct violence applied to the eyeball or to the skull I say nothing, as such cases have for many years been outside my experience; nor do I know anything directly of the retinal haemorrhages said to be frequently found in newborn infants. My reference is to what may be called general bodily violence or physical shock without evidence of injury to the head. Retinal haemorrhages may be observed in these cases, and they have this practical aspect—that as the defect of sight to which they may give rise may be postponed or delayed, the responsibility of the violence for this defect is apt to be contested unless the fundus oculi has been examined in an early stage of the case. The experience is one more argument for the routine use of the ophthalmoscope even when no local claim for this procedure seems to exist.

As a third group, I mention retinal haemorrhages so severe as obviously to endanger vision, yet not provoked by violence, and not accompanied by signs of organic disease in other parts of the body. The most characteristic members of this group fall into the class described by Mr. Eales of Birmingham in 1880; the patients, lads or young men, the victims of severe, perhaps recurrent, retinal haemorrhage in one or both eyes, but otherwise apparently healthy though often giving a history of more or less extreme epistaxis. Upon cases of this order I propose to offer three remarks.

First, in Mr. Eales's original records every patient is said to have shown a "trace," or "a faint trace," of albuminuria. Happily no individual observer, I take it, sees many of these cases, but in my own experience, limited in this respect as it is, I have not detected albuminuria, and I suggest the point as one upon which members might give the Congress the benefit of their observations.

Secondly, Mr. Eales described in the retina, in cases that he named examples of "temporary functional albuminuria," "white specks . . . presumably from previous haemorrhages," the patients being males of 11 to 28 years of age. Now albuminuria in apparently healthy persons is a problem often presented to the physician, the question being, Is the albuminuria an expression of mere functional disturbance or is it a signal of organic renal disease? Personally I should say that one of the notes of functional albuminuria is the absence of retinal change, and retinal haemorrhages or "white specks . . . presumably from previous haemorrhages" would make me hesitate at so innocent a diagnosis. There must be, I imagine, many members of the Congress who have been asked to report on the ophthalmoscopic facts in case of albuminuria of more or less uncertain significance, and experiences gathered in this direction would, I am sure, be a valuable contribution to the present discussion.

My third remark is: If the essential note of Eales's disease is retinal haemorrhage unprovoked by violence and unaccompanied by evidences of organic change, then it will be very difficult to confine this name in any scheme of logical classification either to youthful patients or to the male sex. For, undoubtedly, retinal haemorrhage, strictly under the conditions just defined, occurs in middle-aged and even in elderly persons; and some of the victims are women. In other words, while the most extreme and disastrous examples of what may be called spontaneous or unexplained retinal haemorrhages are found in young men, this fashion of haemorrhage is not restricted to the earlier years of life, nor is it confined to the male sex. If a line of division is to be drawn between true cases of Eales's disease and other cases of apparently spontaneous retinal haemorrhage, I ask members of the Congress to say exactly where it is to be drawn. The difficulty is a real one. It is illustrated, to take but a single example, in a paper written some years ago by Mr. Leslie Paton and Dr. Erasmus Paramore, where, in a short series of unexplained haemorrhages, the writers include two women, one aged 27 years and the other 34 years. The point is one that seems to invite discussion.

At first sight it might appear that uncomplicated and unexplained retinal haemorrhage forms purely an ophthalmological problem. But really it is not so. On the contrary, it occupies merely one page of a fairly considerable chapter. For haemorrhages apart from violence, and unaccompanied by appreciable organic change, occur in almost all parts of the body.[1] Epistaxis, for example, without nasal lesion is so well known that its occurrence is little more than a mildly exciting domestic incident; haematemesis does not always mean ulceration of the gastric or duodenal mucous membrane; there are cases of haematuria, not infrequently recurrent haematuria, in which no structural alteration can be found in the urinary passages; even haemoptysis sometimes stands in a similar enigmatic position; and cerebral and cerebellar haemorrhages in adolescents are by no means altogether unknown. Thus retinal haemorrhages existing as an isolated clinical event have their parallels if not their explanation. An explanation is indeed difficult. So far as I have followed the discussion the key seems to have been sought in one direction, and in one direction only—namely, in an attempt to determine an alteration in the coagulation rate of the blood. The results have not been encouraging, for, while on one side it is announced that coagulation is hastened, we hear from other quarters that coagulation is delayed; and the confusion is increased by a

* Introduction to a discussion at the Oxford Ophthalmological Congress, July 6th, 1922.

[1] See Sir Wm. Hale-White, *Lancet*, 1912, i, p. 416: and Professor George R. Murray, *British Medical Journal*, 1913, ii, p. 1521.

third statement to the effect that no departure from the normal can be appreciated. With all respect I dare to say that even were this point finally and authoritatively settled we should still be without an explanation of the haemorrhage. For, while the readiness, or the difficulty, with which the blood coagulates must be a large influence in determining the volume or duration of a haemorrhage, no modification in either of these directions will account for the actual occurrence of haemorrhage. To produce this there must be rupture of vessels, and rupture of vessels, in the absence of violence and of increased intravascular stress—and neither of these factors is in issue here—can only follow changes (nutritional or structural) in the vessel walls. It is therefore in the direction of agencies calculated to damage the walls of the vessels that an explanation of these quasi-spontaneous retinal haemorrhages must be sought. There are here two considerations which may appropriately be borne in mind.

First, it is beyond doubt that the walls of the finer blood vessels are particularly susceptible to the influence of pathological changes in the blood quality; and it would seem that in at least many of these changes each has its special or selected area of mischief. Thus in typhus we get haemorrhages in the skin; in scurvy, in the gums; in Henoch's purpura, in the intestinal wall; in influenza, epistaxis; and in cantharides poisoning, haematuria. Evidently in each of these instances the blood vessels in a particular area have been damaged by a poison that has to the affected vessels a specific pathological relationship. Is it not probable that in similar fashion the retinal blood vessels, or the retinal blood vessels in some persons, may be damaged by modifications of the blood quality that are at present beyond our power of detection and recognition?

A second influence possibly related to these spontaneous retinal haemorrhages is that the blood vessels in different persons possess different degrees of fragility. In some a mere friendly grasp of the arm is followed by ecchymosis, while in others a much greater degree of violence is necessary to produce a bruise. Once again, may it not be that there are individuals in whom the retinal vessels are unduly fragile as the result either of an inherited peculiarity or of an acquired defect, and that upon such vessels minor and perhaps unperceived degrees of violence act with disastrous consequences?

Summing up, therefore, this part of the discussion, I submit the following propositions: That retinal haemorrhages existing as an isolated clinical fact are strictly parallel to other haemorrhages which occur in various parts of the body apart from obvious violence and without appreciable organic lesion; that a departure, even if it exists, from the normal rate of blood coagulation will not account for these haemorrhages; and that the probable explanation is rupture of vessels following damage to their walls, this damage in turn resulting either from some subtle change in the blood quality or from slight degrees of violence—perhaps mere changes in intraocular tension—acting on vessels which for one reason or another are particularly susceptible to the destructive influence of mechanical forces. Possibly it may be suggested that the event immediately antecedent to the haemorrhage is thrombosis; and this may well be true. But thrombosis in its turn requires an explanation, and it may be doubted whether intravascular blood clotting ever occurs in vessels which possess a healthy and undamaged endothelial lining. So that once again there is need for prior damage, nutritional or mechanical, to the vessel wall. Given this, either direct rupture is conceivable, or thrombosis, this latter establishing circulatory conditions which mean a breach in the integrity of the vessel and the escape of the fluid contents into the neighbouring tissues. In a word, whether the rupture immediately responsible for the haemorrhages is direct or is secondary to thrombosis, there is necessary as an antecedent event some preliminary prejudice to the anatomical or physiological values of the vessel wall.

I now propose to find support for the order of events just suggested—that is, damage to the vessel wall, thrombosis, rupture, haemorrhage—in the retinal haemorrhages (a well-known class) consequent on thrombosis of the central retinal vein. I have had the opportunity of examining for my surgical colleagues a considerable number of cases of this order, and with three exceptions (to be mentioned later) the patients have been elderly—50 years and upwards—and have exhibited evidences, and often conspicuous evidences, of cardio-vascular degeneration—thickened and deformed arteries, high sphygmometer readings, left cardiac hypertrophy, and sometimes albuminuria, though rarely convincing signs of nephritis. Here, then, we have manifest and undeniable evidence of structural alterations in the vascular apparatus, and even apart from actual pathological demonstration—and this is by no means wholly wanting—there is a moral certainty that with evident arterial degeneration changes of a similar order will be present in the walls of the veins. Upon such damaged areas clot formation may readily be implanted, with, as a natural consequence, blocking of the circulatory movement, further prejudice to the vessel wall, rupture, and haemorrhage.

It may, however, be said that the argument here presented cannot apply to the occasional cases of thrombosis of the central retinal vein occurring in young persons free from obvious vascular disease and offering normal or approximately normal sphygmometer readings; and it must be admitted that in such cases we cannot claim the overt evidence of vascular disease seen in elderly persons affected by retinal venous thrombosis. On the other hand, it is certain that young persons are not altogether free from the risk of thrombosis, as is seen, for example, in the case of chlorotic girls. Such thrombosis must be either primary—that is, spontaneous—or secondary to changes in the vessel wall at the site where the clot formation takes place. But spontaneous intravascular blood-clotting is, for reasons already given, highly unlikely. Hence it seems necessary to admit that even when objective evidence of change in the vascular structures is wanting the occurrence of thrombosis implies that such change as a fact has actually taken place. In other words, retinal venous thrombosis, in the younger patients as in the elderly, is secondary to some fashion of alteration in the vessel wall. My suggestion, therefore, is that such cases form, as it were, a connecting link between the group of unexplained haemorrhages already considered and the cases of retinal venous thrombosis as this is more commonly seen in elderly patients. In all, I assume as the primary event pathological changes in the vessel walls, and following these changes either direct rupture or thrombosis prior to rupture. The groups, however, differ from one another in the site of the preliminary vascular damage and in the degree of clinical evidence available for the recognition of this damage.

I now pass to retinal haemorrhages—other than those consequent on retinal venous thrombosis—found in association with high sphygmometer readings. Personally I speak of "high sphygmometer readings" rather than of "high blood pressures," for the sphygmometer reading is a fact, whilst its translation into terms of blood pressure involves an inference, and an inference, moreover, which has not wholly escaped an accusation of inaccuracy. If in scientific terminology names having a descriptive quality are selected, clearly they should be descriptive of facts and not of opinions about facts. Our immediate point, however, is the significance of retinal haemorrhages in patients yielding high sphygmometer readings. This group is a fairly considerable one, but its constituent members differ widely from one another both in character and in outlook. At one extreme are cases of renal disease without dropsy—the so-called small white kidney—occurring in young adults, often marked by epistaxis, and leading almost invariably in the course of a few months to a fatal issue. At the other extreme is a single haemorrhage in, say, a middle-aged or elderly patient, possibly destructive of central vision in the affected eye, but, as proved by the subsequent course of events, quite consistent with health and activity prolonged over a considerable term of years. And between these two extremes lie various degrees and gradations of arterial change and various degrees and gradations of renal mischief. In either extreme, as well as in the intermediate cases, retinal haemorrhage may be the first event to attract attention, or the haemorrhage may be found on examination, although the patient has not recognized any visual disability. Does the occurrence of retinal haemorrhage render any substantial assistance in the differential diagnosis or in the prognosis of the members of this large and varied group? I doubt it. Guidance in these directions is to be sought, not in the presence or the absence of retinal haemorrhage but in the state of the heart, the condition of the arteries, and in the efficiency or non-efficiency of the renal excretory functions.

In connexion with this last-mentioned group of cases it is well to remark that high sphygmometer readings, and even very high readings, by no means necessarily involve retinal haemorrhage; indeed, in the majority of cases of this order the fundus oculi is normal, or at least free from haemorrhage;

and this is true even when so disastrous an event as cerebral apoplexy is the commanding fact in the clinical picture. Thus it seems safe to say that retinal haemorrhages are not produced by the "bursting" of healthy blood vessels—or for the matter of that of degenerated blood vessels—under the stress of increased intravascular pressure, even allowing—what is a disputed point—that a high reading obtained from the brachial artery means increased blood pressure within the retinal vessels. Retinal haemorrhages, as I have already argued, mean, indeed, rupture of vessels, but the essential cause of this rupture is, not increased intravascular stress, but degenerative changes in the vessel walls. Support for these propositions is found in yet another group of cases—namely, those in which there is manifest arterial degeneration without high sphygmometer readings; for in such cases retinal haemorrhages may be present—may be present, that is, when, at least so far as the sphygmometer can be trusted, the blood pressure is not abnormal. In other words, high sphygmometer readings—or, if you will, high blood pressures—do not *per se* involve vascular rupture, while vascular disease may lead to rupture even when the alleged measurement of blood pressure is well within normal limits. It is change in the value of the vessel wall that is the necessary preliminary to rupture and haemorrhage, and this change either may or may not be associated with a high sphygmometer record.

Perhaps here I may be allowed a word in appreciation of the work done by ophthalmic surgeons on the pathology and clinical evidences of degenerative disease of the blood vessels. It has helped towards the solution of not a few obscure problems.

Of retinal haemorrhages in glycosuria there is little to be said. They are found, as everyone agrees, not in the typical diabetes of the earlier years of life but in middle-aged or elderly persons with slight or moderate symptoms and non-extreme degrees of glycosuria. They may or may not be accompanied by retinitis. When, as sometimes happens, the glycosuria disappears for a more or less prolonged interval the ophthalmoscopic picture may be a very puzzling one for an observer ignorant of the patient's earlier history. Upon prognosis in glycosuria retinal haemorrhage as such exerts little or no influence; the haemorrhage is quite consistent with active life continued during many years.

In the course of our discussion we are likely to hear of the differences—the diagnostic differences, as some affirm—between retinal haemorrhages in glycosuria and retinal haemorrhages in albuminuria. I admit the interest of the comparison as a subject for ophthalmoscopic contemplation and as an opportunity for the cultivation of the sporting spirit in the art of diagnostic adventure. But the observation has little clinical value. At best the conclusion suggested is a probability, and a probability which no one will say is invariably justified by the event. Moreover, the procedure is an offence against a sound and sensible rule—important in medicine as in law—that second-rate evidence ought not to be accepted when first-rate evidence is available.

I have now briefly to refer to certain clinical situations in which the discovery of retinal haemorrhages has a high practical value, inasmuch as such a discovery may save the practitioner from error and may indicate the route along which an accurate diagnostic conclusion is to be sought. Experiences of retinal haemorrhages as the first clinical event in renal disease, in glycosuria, and in arterial degeneration, are obvious illustrations of this proposition. A few others may be mentioned.

First, a doubtful or ambiguous appearance at the optic disc will be confidently interpreted if the suggestion of a possible commencing optic neuritis is accompanied by one or more small linear haemorrhages. They may require close observation, but once detected there can be no question of their significance.

Next I mention septicaemia and septic endocarditis. Quite a number of such cases are clinically, and for a more or less prolonged period, cases of unexplained temperature—fever without physical signs; and such diagnoses as tubercle, enteric fever, paratyphoid, and *Bacillus coli* infection of the urinary passages come up for discussion; or, again, with the fever are joint pains, and acute rheumatism offers itself as an appropriate label; and once more, in a patient known to be the subject of a chronic valvular lesion occurs an outbreak of febrile temperatures, and a recrudescence of active rheumatism is a tempting explanation. Yet in every one of these instances an ophthalmoscopic examination may promptly and confidently alter both the diagnostic position and the prognostic outlook, for retinal haemorrhages are not to be expected either in tuberculosis, or in enteric fever, or in paratyphoid, or in *B. coli* infections, while in septicaemia and in septic endocarditis they are quite frequent events.

Another disease in which the presence of retinal haemorrhages affords much help is pernicious anaemia. Here again, though rarely I admit, the problem presents itself in the form of unexplained pyrexia, and the anaemia and weakness are readily regarded as consequences of the high temperature, and for this an explanation is sought in the directions already indicated; the detection of retinal haemorrhages in such circumstances is of great practical value. On the other hand, a more or less severe and prolonged anaemia may be attributed to chlorosis, to dyspepsia, to malnutrition, or to some other more or less indefinite influence. The recognition of retinal haemorrhages here ought to sound a note of alarm, for such haemorrhages are frequent in pernicious anaemia, whereas in chlorosis and in secondary anaemias they are either absent or, if occasionally present, are slight in degree, few in number, and confined to extreme and advanced cases. Even a wider generalization may be ventured—namely, that retinal haemorrhages in the absence of renal disease, of glycosuria, and of arterial degeneration mean either sepsis or one of the so-called blood diseases, and particularly pernicious anaemia and leukaemia. Rarely they are due to malaria, and very rarely to syphilis; personally, I have not seen them in haemophilia or in Hodgkin's disease, and only once in purpura haemorrhagica. Retinal embolism and thrombosis of the retinal vessels perhaps ought to be mentioned, but in each of these there are in the history and in the ophthalmoscopic examination characteristic facts which reduce the attendant haemorrhages to a purely subordinate position. In addition, the generalization just proposed is qualified by the "unexplained" haemorrhages to which reference has already been made, and by the necessary remark that propositions which pretend to absolute values in the field of clinical medicine, however serviceable for general guidance, are apt now and again to suffer in their dignity by the arrival of events and combinations which contradict them.

In a congress of ophthalmic surgeons it would be gratuitous to insist on the importance of examining each fundus oculi, and yet it may be well to remark that even in so generalized a disease as pernicious anaemia retinal haemorrhages may have, at any rate for a time, a purely unilateral distribution.

Conclusions.

Finally, I submit the following practical conclusions—namely:

1. That retinal haemorrhages may exist without recognized prejudice to vision, and ophthalmoscopic examination is therefore a necessary part of every clinical examination.
2. That such haemorrhages may be the first objective signs of serious disease, and a discovery of them, therefore, demands a complete examination of the patient.
3. That the recognition of retinal haemorrhage is often of high value in directing the observer to a correct interpretation of the clinical facts, while the prognostic significance of the observation *per se* is indeterminate.
4. That retinal haemorrhages do occasionally exist as isolated clinical facts, and when so existing are comparable to haemorrhages in other parts of the body (haematemesis, haematuria, haemoptysis, etc.), for which no ready explanation is at hand.

A METHOD OF REDUCING CONGENITAL DISLOCATION OF THE HIP.

BY

F. W. GOYDER, F.R.C.S.,

HONORARY SURGEON TO THE BRADFORD ROYAL INFIRMARY.

Reduction of a congenital dislocation, except in very young children, is not always the simple matter described in the textbooks. When the ordinary methods of pulling, lifting, and levering are employed the operator works under mechanical difficulties, and, unless well equipped physically, is likely to fail. So much energy is expended in pulling that proper control over the movements of the head of the femur is lost, and if the help of an assistant be utilized there is often want of complete co-ordination between the manipulators. In any case much energy is wasted. The method here described appears to me to avoid misdirected effort and

to put the movements of the head of the femur completely under the control of the operator. I can find no procedure exactly like it mentioned in the literature, except perhaps Hoffa's "pump-handle" method, but the idea seems so simple that it must have been tried before. Even if it is not new, I can claim to have discovered it for myself.

It requires some strength to pull the head down to the level of the acetabulum, and more strength to maintain it there. It occurred to me, therefore, that it might be much easier to push than to pull, and that if I could, by downward pressure of one hand on the fully flexed knee, push the head below the ill-marked lower rim of the acetabulum, I might with the other hand guide the head into the socket. I was surprised at the control so gained, and at the amount of downward pressure possible.

The method adopted for the left hip is as follows: The patient's sacrum may be placed on a sandbag; the pelvis on the right side must be steadied by an assistant. The knee and hip are flexed, the latter as fully as possible till the knee lies as nearly as can be managed beside the trunk. The right hand of the operator is put upon the patient's left knee and has two functions—first, by downward pressure to push the head towards the acetabulum, and, secondly, by rotation at the knee to direct the movements of the femoral head. The palm of the operator's left hand is placed against the great trochanter with the thumb in front and the fingers on the neck of the femur behind. While downward pressure is maintained with the right hand to keep the head of the femur as low as possible an attempt is made, by lifting with the fingers of the left hand, and depressing the right hand with or without rotation, to put the head below the acetabulum. A little time and some preliminary stretching of the tissues below the acetabulum may be needed, but no great force. The next manœuvre consists in maintaining the forward position of the head while gradually relaxing the pressure on the knee, when the head sinks noiselessly into the acetabulum, often at the first attempt. This done, external rotation at the hip-joint brings the limb into the usual Lorenz position. The thigh should finally be approximately at right angles to the body, and the knee more dorsally placed than the pubic symphysis, so that the head of the femur is fairly prominent in the groin. Reduction should be repeated a few times, noting the degree of prominence of the posterior and superior margin of the acetabulum by the "shock" of redislocation, and the amount of movement possible at the hip-joint without producing redislocation. It will often be found at this stage that reduction has become possible by the more usual method of lifting the head of the femur over the posterior lip of the acetabulum.

The considerations just given appeared at first sufficient in themselves to account for the success of the manœuvre, but an additional explanation of the comparative ease of reduction by this method was afforded by a short but important paper by Mr. A. H. Tubby, published in the *Lancet* of December 20th, 1919, describing an open operation for refractory cases. He emphasized the fact that in older children the ilio-psoas tendon is, after the adductors, the greatest bar to reduction, because it produces a virtual, and in late cases an actual, narrowing of the capsule of the hip-joint where the tendon crosses. This constriction prevents the head from passing through the "button-hole" in the capsule and lodging in the acetabulum. The tendon divides the capsule of the dislocated hip-joint into two communicating cavities—an inner one, of which the acetabulum is a part, and an outer one containing the head of the femur. Full flexion in my method relaxes the grip of the tendon; downward pressure puts the head of the bone to the acetabular side of the relaxed ilio-psoas, and, unless there is real narrowing, relaxation of downward pressure allows the head to enter the acetabulum without the intervention of the folded capsule of the hip-joint. It is important to remember that the success of reduction by this method does not necessarily obviate an open operation, because when the leg is extended the tendon again becomes tight, perhaps sufficiently so to cause redislocation. But that point does not apply to the more limited purpose of this paper.

I have found this method of the greatest value in neglected cases of congenital dislocation. It renders unnecessary long-continued extension of the limb and exsection of portions of the adductors and other muscles. In younger children it may avoid a preliminary division of the adductors. Hence I commend it to all who have encountered difficulties in reduction by the well-established methods.

FRAGILITAS OSSIUM ASSOCIATED WITH BLUE SCLEROTICS.

BY

HALL STEWART, M.B., B.CH., D.P.H.,

HOUSE-SURGEON, ULSTER HOSPITAL FOR CHILDREN AND WOMEN, BELFAST.

[*With Special Plate.*]

THE publication of Dr. J. B. Alexander's paper on "Fragilitas ossium associated with blue sclerotics" in the BRITISH MEDICAL JOURNAL of April 29th, 1922, leads me to report the following series of cases:

Case 1.—L. G., a girl with blue sclerotics, aged 7 years, has been treated in this hospital on different occasions for ten complete and two greenstick fractures. She was first admitted in 1917 when 2 years old, suffering from a fracture of her left femur, and since then has been treated for the following fractures: right femur, six complete and one greenstick; right humerus, two complete; right tibia, one complete and one greenstick.

Case 2.—T. McV., a boy with blue sclerotics, aged 2 years, half-brother of L. G. (Case 1), is at present in hospital suffering from a fracture of his right femur.

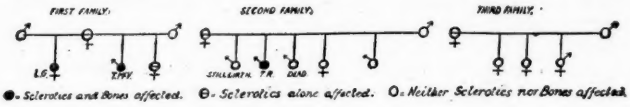
Case 3.—T. R., a boy with blue sclerotics, aged 7 years (cousin of L. G. and T. McV.), has had six fractures of his leg bones. In 1917, when 2 years old, he was admitted to this hospital with his right tibia and fibula broken. Since that time he has been treated for the following fractures: right femur, two complete; right tibia, one complete; left tibia, one complete; right fibula, one greenstick.

These three children are poorly developed and have prominent foreheads. The only other member of the family to which Cases 1 and 2 belong is a female infant, aged 5 months. She also has blue sclerotics.

The broken bones united at about the normal rate. Union was firm, though callus formation was scanty. *X*-ray photographs showed the cortex of the bones to be excessively thin and the medulla somewhat diffuse. The fathers of these children showed no apparent abnormality.

The mother of L. G. and T. McV. (Cases 1 and 2) has blue sclerotics and has suffered from partial deafness since childhood. She gives a history of having had her right femur fractured on two occasions. The first fracture occurred when 2 years old, and the second two months later. She has seven sisters and two brothers, all younger than herself. None of them suffer from undue fragility of their bones. The three eldest of these are females, and have blue sclerotics. The second member of the family is the mother of T. R. (Case 3).

The relation of these individuals to each other is shown in the following tree:



The points of interest in this series of cases are:

1. The four eldest members of the family have blue sclerotics; the children of the two eldest suffer from fragilitas ossium and blue sclerotics, while the children of the third are apparently normal. The fourth sister, who died some years ago, was unmarried.
2. The great preponderance of right-sided fractures.
3. The leg bones are chiefly affected.
4. The first fracture in each case occurred at 2 years of age.
5. Only one case of deficient hearing.
6. All cases with brittle bones have blue sclerotics, but several cases with blue sclerotics have apparently normal bones.

I am indebted for access to these cases to Mr. S. T. Irwin and Dr. R. J. McConnell, under whose care they have been.

BEFORE the war the birth rate in Germany and the natural increase—that is, the excess of births over deaths—were greater in Germany than in this country. The death rate also was higher. The *Morning Post* has recently published some interesting statistics of the German rates in the second quarter of this year. For the forty-six great towns of Germany the birth rate was 18.5, whereas in England and Wales it was 22.2. For the same period the death rate in Germany was 13.5, and in this country 12.7. The rate of annual increase in England and Wales in the period 1904–13 was 11.2; in the second quarter of this year it was 9.5. In Germany before the war the rate was 15.1, but in the second quarter of this year it was only 5.

W. J. O'DONOVAN OCCUPATIONAL DERMATITIS.

FIG. 1.—Electric burn, due to contact of gold ring with transformer.

FIG. 2.—Chrome ulcers after one week's work.

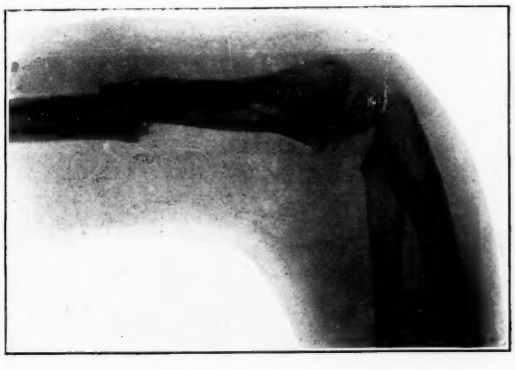
FIG. 3.—Eruption of one week's duration, pustular and scaling, due to yellow chrome.

FIG. 4.—Hyperkeratosis of palm of hand, due to use of a scraper; the patient was a painter.

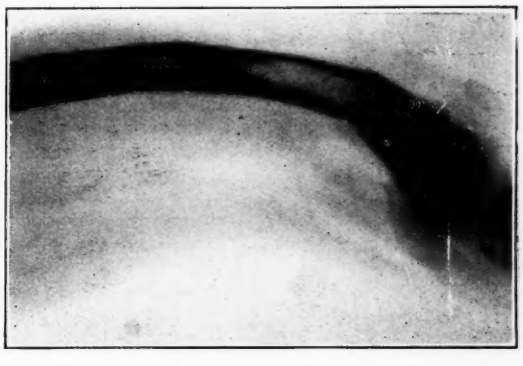
FIG. 5.—Epithelioma of thumb, due to handling a hot iron poker.

FIG. 6.—Purple discrete and confluent papular erythema with adherent crusts; the patient was engaged in filling boxes with phosphorus matches. (Patient was ten months under treatment.)

HALL STEWART: FRAGILITAS OSSIUM ASSOCIATED WITH BLUE SCLEROTICS.



Right humerus of Case 1.



Structure of bone and sites of fractures in right femur of Case 1.

F. HERNAMAN-JOHNSON: THE VALUE OF GAS INFLATION IN *X*-RAY DIAGNOSIS.

FIG. 1.—Composite radiograph of peritoneal cavity in profile. Note adhesion near needle. Profile of liver is well shown.

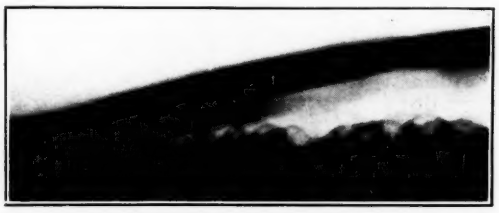


FIG. 2.—Normal lower abdomen seen in profile.

FIG. 3.—Abdominal tumour in profile (Dr. Finzi's case).

FIG. 4.—Calculus, showing one large and five small stones (tube above).

FIG. 5.—Calculus. Same case as Fig. 4, but with tube below. Note that only three small stones are shown in this plate.

FIG. 6.—Perirenal inflation, showing suprarenal body.

NINETIETH ANNUAL MEETING
OF THE

British Medical Association.

Held at Glasgow, July, 1922.

PROCEEDINGS OF SECTIONS.

SECTION OF DERMATOLOGY.

H. LESLIE ROBERTS, M.D., C.M., President.

DISCUSSION ON OCCUPATIONAL DERMATITIS.

OPENING PAPER

BY

W. J. O'DONOVAN, O.B.E., M.D., M.R.C.P.,
First Assistant in the Skin Clinic, London Hospital.

[*With Special Plate.*]

STUDENTS of skin diseases, once they have mastered and appreciated its historic nomenclature, are stimulated in their work by the consciousness that cause and effect are demonstrated before their eyes in a manner paralleled only by the practice of Tropical Medicine. Preventive medicine, the keynote of to-day, is based fundamentally on accurate knowledge of etiology, and I appreciate that the Section in asking me to read a paper on Industrial Dermatitis is really paying tribute to an etiological factor recognized in dermatology but not pursued as it should be in this country, whose civilization and prosperity are now founded on industry.

It is fair to say that my hospital, the London Hospital, is favourably situated for an industrial study, since around it are grouped not one main type of industry, as in a mining centre or a fishing town, but hundreds of separate industries that employ their thousands resident about the hospital. The tonnage of the Thames and the barge transport of the Lea Valley bring within our ambit industries as far apart as fig pulping and explosives making. The proximity of the Home Office, too, is of importance to us in London, since without the kind and constant encouragement of Dr. T. M. Legge the collection of material for this special study would have flagged in the onrush of ordinary but overwhelming hospital dermatological work.

Technique of Study.

In the first place, every man or woman who comes to the skin clinic at the London Hospital is asked his or her occupation—not in general terms, but an attempt is made to find out their actual occupation, what they handle, what is the name of the acid or dye or wood they use, how long they have been at this, and whether other workers are similarly affected. When possible they are asked to bring for inspection a sample of the substances which may be the cause of their lesions, and, but rarely, we have been able to visit the factory, wharf, or workshop concerned. A record in writing is, of course, made of the nature and extent of the lesions, and their present state and progress are recorded by photographs—the only way of saving any skin department from the labour of interminable verbiage and for bearing which expense we (Dr. Sequeira and myself) are most grateful to the Governors of the London Hospital.

Industry is complex and technical, varying trade names cover identical formulae, and years of wide experience have made these details known and appreciated at the Home Office, whose mine of special knowledge I gratefully own is almost inexhaustible. A worker's knowledge of his own industry is often an empty ignorance—"chemicals," "drugs," "red dye" is often all the description he can supply of a substance he has handled for years; hence I have often found it necessary to write to a man's employers, and, should they fail, to the Factory Department of the Home Office, to find out what was the actual dye or other substance implicated.

Industrial dermatitis is not at present a wide field for compensation cases, and therefore truth-telling among workers, their unions, and their employers, is fortunately prevalent at present. Statistics we have not attempted to keep, since to be of value they must be complete and widespread in their survey, and this can only be done by statutory notification. We ourselves make a habit of notifying all our interesting cases to the Home Office, in return for the help we receive and because we realize that these diseases cannot be prevented until their type and prevalence are recognized. We realize that prevention is best left in the hands of experts familiar with factory technique and managerial difficulties, the habits of the workers, and medical administration. I feel that this study is the type of observation on which prevention must be based, but that this prevention is no function of dermatological study.

In this paper I make no references to literature, which in English is very scanty, save for Prosser White's invaluable and pioneer guide-book, now in a second and much improved edition. I propose to attempt to add perhaps a little to knowledge by recording solely my own clinical experiences.

Friction: Hyperkeratosis and Cancer.

Two instances of local palmar keratoses have been seen.

A painter, aged 40, showed a triangular patch of dark, very thick, and fissured skin, having its base along the ball of the right thumb; this he had had for over fifteen years, and of late it had become sore and painful while at work. It was due to the constant, almost daily, use of a scraper held always against the right palm, while working with a blow-lamp in the left. His left hand was unaffected. The Wassermann reaction was negative. Temporary rest and salicylic acid ointment gave rapid relief. (See Fig. 4 in Special Plate.)

Mrs. R. P., aged 48, was a stout woman, by trade a boot-soler. Her work consisted of holding pieces of wet leather in her left hand and hammering it out with a short hammer held in the right hand. The constant rubbing of the short handle caused a great thickening of the palmar skin, which was sore, tender, and rough; its fissures were all deepened, widened, and excoriated, and she was unable to continue her occupation.

The connexion between occupational trauma and carcinoma could hardly be more beautifully illustrated than in the following case.

C. K., aged 65, an alien baker in the East End. For certainly over thirty years he had been employed in a small bakery, and for over ten years had noticed the development of a small wart at the middle joint of his left thumb, where a long and hot iron poker was continually rubbing during his daily work. For the last six months this wart had grown rapidly and ulcerated, and because of occasional haemorrhage he had sought hospital assistance. A microscopic section from the edge (see Fig. 5) showed the growth to be a squamous-celled carcinoma. The patient refused operative relief.

The following is, as far as I can find, a unique case, but perhaps the experiences of the meeting may bring other wedding-ring carcinomata to light.

Mrs. W., aged 78, came to our clinic this year suffering from a squamous-celled epithelioma of the left ring finger; it had existed for twelve months, and extended for half an inch, as a nodular hard growth, above and below a shallow irregular ulcer in the site of her recently removed wedding ring. There were no enlarged lymphatic glands, the finger was amputated and she is now well.

A third case of what I would term friction carcinoma of the tongue.

G. H., a boot repairer aged 48, has repaired boots since the age of 18 and has always when at work held a supply of "brads" or small rivets of iron or brass in the right side of the mouth. He used to work them one at a time forward towards his lips so as to have one always to hand and so save time. For three months the right side of the tongue has been sore and painful. He could protrude his tongue easily and on the right side was a raised, firm, slightly ulcerated tumour, circular in shape, about the size of a shilling; the diagnosis of carcinoma was confirmed by the microscopic finding of prickle-cell processes in the tongue muscle. In addition the surface of the tongue showed a mild condition of superficial glossitis—it was mostly white, glistening, and smooth, with some transverse furrowing; there was no fissuring or erosion of the tongue generally, and it did not resemble the usual advanced syphilitic infiltration of the tongue on which carcinoma is only too common an epiphenomenon, but the Wassermann reaction was positive, and the patient was treated by both operative and anti-syphilitic measures. This is a case of local long-continued trauma producing a carcinomatous overgrowth in a tongue damaged, though slightly, by syphilis. The patient remembered a venereal sore when a young man, treated as a chancre, but not perseveringly.

After syphilis, tubercle.

H. K., a taxi driver, aged 44, has large sheets of long-standing lupus on his limbs, but he developed a carcinomatous ulcer on the front of his left wrist, where for years a lupoid dry patch of skin had

rubbed against the driving wheel. Six months of discomfort drove him to seek medical aid. He died under a general anaesthetic in 1920.

Dermatitis and Dirt.

Contrary to one's expectations dirty work in the ordinary use of the term does not particularly predispose towards dermatitis. Quite the dirtiest factory I ever visited was one employed in the breaking down of used or damaged anti-gas masks. The masks arrived in hundreds often covered with mud, dust, or blood-stained or stinking, and were separated into their components by scores of women without protective appliances or anything like adequate washing facilities. On the day of my visit there was no soap and the towels on view were dripping wet, yet save for an outrageous case of dermatitis artefacta no cases of sore hands occurred at this work. The cleaning and repairing of old sacks gives employment to many women about the hospital, yet only two cases have come before us in which the work could be held to be responsible.

G., aged 32, had an outcrop of large tense bullae on the hands, which was attributed to the work, which the patient said was very dirty. She showed bullae, varying in size from 2 mm. to 3 cm. across, on both sides of both hands, most being present along the outer border of the thumb; a very large one was situated across the centre of the palm. They contained either clear or turbid fluid, and small burst blisters showed adherent impetiginous crusts.

The mending of old oat sacks was attended with very serious ill effects in the case of Mrs. H. H., aged 52, who had worked at this from December 5th, 1917, until early in January, 1920. When seen on January 13th, 1920, the tips of all her fingers were red, sore, and scaling, and on the palmar aspects of her fingers were numerous closely set minute vesicles; all her nail-beds were infiltrated with pus, and she had shed two nails from her left and three from her right hand; no fungus was found on scrapings; red lines of lymphangitis were present on the right forearm with epitrochlear adenitis.

Dirty work is common, yet dirt dermatitis is rare. Coal-mining is dirty work, yet "miners' itch" needs, in addition to coal dust, the maceration of the skin by standing in water at work. At a brass-rolling mills I examined in 1918 over fifty men blackened all over by a deposit of zinc dust sublimated from many crucibles in a room that was an inferno of heat and clouds of opaque metal fumes, yet though these men were unselected and had been at this work for over twelve months, I saw no dermatitis among them; yet by absorption zinc "bends" (or agues) were common amongst them.

Water Rashes.

As a strong antithesis to the above one can say confidently that occupations in which water comes into frequent or prolonged contact with the hands are attended with a very real hazard of dermatitis in either sex at any period of life. The addition of any cleansing agent, whether acid or alkali, adds notably to the risk.

A. P., a healthy male of 21, was a fishmonger's assistant, and had worked at this for over twelve months; he says his hands were constantly in running water but he did not handle brine. His hands when seen had troubled him with itching and soreness for about a week; they presented a beautifully symmetrical eruption of reddened excoriated papules aggregated into irregularly oval areas on the ulnar sides of the backs of both hands. This eruption cleared up in a week of rest from work and the application of calamine lotion, and, without inquiry into his occupation, would have been termed an eczematous dermatitis.

Four weeks later L. D., aged 18, came to the clinic with an eruption very much resembling that of A. P.—similar in distribution on the backs of both of her hands and extending up over the backs of the inner three fingers. Her trouble had come and gone at intervals over three years; during all this time she too had worked in a fishmonger's shop, handling wet fish throughout the day.

It is hard to associate the displayed enamel advertisements on the railway stations with an occupational risk, but the following case is evidence that such a risk exists.

T. W., aged 41, had had no skin trouble until in destitution he accepted the job as a cleaner of these signs; for three months he had been at this work, using as a rule water only, but when the dirt was very adherent it was his habit to add an uncertain amount of spirits of salts to his pailful of cleaning water. This produced an inflammatory reaction extending from the backs of his fingers up both forearms half-way to the elbows. The palms and nails were unaffected. About the wrists the skin was red, thickened, excoriated, and scabbed, but as one looked critically farther up the rash resolved into discrete red papules either with an excoriated surface or with a small adherent whitish scale. Here, as is almost the rule in occupational dermatitis, a rapid cure followed rest from work and the application of calamine.

The skins of the young seem particularly sensitive to continuous immersion in water.

Emma M., aged 19, had worked for two and a half months near the hospital washing out jam jars in hot weak soda water. When seen on March 30th, 1920, there were large turbid bullae on the backs of her little fingers and chains of small blisters, some broken, some excoriated and septic, along the contact edges of her other fingers; there was no adenitis and no perionychia in this case.

Among elderly women many find constant employment as scrubbers, and a few develop an eczematous condition of their forearms and backs of the hands and fingers; the skin is reddened and thickened, it shows many erosions and fissures over sites of flexion, but higher up discrete follicles are discoverable. I mention this type of case to sound a warning against their re-employment at this work once their skin has become vulnerable. A well-established eczema of the hand, renewed by an immersion into hot soda water, may put the worker on the sick list for an intolerable period of time; a short dose of *x* rays is the best means of hastening a cure in indolent cases of this character.

It was in a professional scrubber, Sarah W., aged 48, that I saw at the base of the left palm a prominent oval bursa covered by a thick broad callosity; occupational bursae are not common, and this, though out of place, may perhaps be recorded here.

Two *dental mechanics* have come under my notice: both had lesions similar in appearance and distribution to many other cases of "professional" dermatitis; both showed thickening, redness, fissuring, and scabs on the backs of the hands, knuckles, and fingers of both hands, Mr. A. B. having perionychia of the nail of the left index finger; yet, considered together, they illustrated what appears to be a maxim in industrial dermatitis—namely, that *skin reactions may be constant to varied irritants.* Jessie W., aged 30, handled plaster-of-Paris, rubber, benzine, and "green acids" for cleaning metal plates; whilst A. B., aged 34, handled plaster, rubber, hydrochloric and nitric acids; both may have been reactions to an acid irritant, but benzine is not innocuous, as is shown by the case of Kitty R., aged 19, who had been a golf-ball painter for over six months and who cleaned her hands after work in the naphtha used as a paint solvent; on the backs of both her hands and fingers were circular areas made up of aggregated small red follicular papules with abraded surfaces and small adherent scabs. It took from October 4th, 1919, to December 22nd of that year before these lesions were well, although she was kept from work and the hands were dressed daily with zinc carbonate and lanoline ointment. Naphtha and phosphorus (Fig. 6) appear to give rise to very chronic resistant affections.

The Food Industry.

The food industries that have come before us as cases of dermatitis have been singularly few. Barley, peas, figs, flour, and sugar have been the only agents brought to my notice.

T. S., aged 49, was a case of barley itch. He had been engaged in unloading a cargo of barley from Morocco and had had an itching eruption for about two days; others of his mates were, he said, similarly affected. On both his arms and on the outer sides of his thorax was a heavy outbreak of close-set, large red papules, many unbroken, many with scabbed or bleeding apices. The whole eruption cleared away quickly on the application of 2 per cent. naphthol ointment, but when, three days later, he brought us a sample of the grain no parasites could be obtained.

June is the season of pea picking, and a Romford resident aged 51 came to Dr. Sequeira's clinic on June 30th, 1921, with extraordinarily large bullae on her left elbow and both wrists, due to the irritating effects of the May weed. Although this affection is known in certain localities, and the irritant effects of this plant are known to botanists, yet so unique was it in our experience that Dr. Sequeira published a full and illustrated clinical note in the *Lancet* of September 10th, 1921.

The *Carpoglyphus passularum*, or "sculptor of figs," is not recognized as a parasite of dermatophilic tendencies, and S. S., aged 24, is possibly the only case of this on record. This was a sturdy workman employed in shovelling up a store of figs that were to be made into jam for domestic use. Of twelve workers on this job eight were similarly affected. On June 17th, 1920, on the forearms, backs of the hands, and on his face, were close-set reddish and pink itching papules of small size; they had been present for six days. S. S. kindly brought for us a sample of the figs, which were small and

apparently dusted over with a fine brownish deposit, which on close inspection appeared endowed with movement. Microscopic examination of this dust revealed the fact that it consisted of a countless horde of parasites, many alive, many dead, and many in fragments; larval, pupal, and adult forms could be seen. It is some comfort to reflect that jam, even from cheap figs, is made by a sterilizing process.

My friend Dr. Ingor Willey, who is the medical officer to a very large baking firm, tells me that he has seen many cases of bakers' itch, yet I have seen only one example of this affection; it may be that the condition responds well to simple treatment, and these cases do not reach hospital, for certainly bakeries are numerous throughout the East End and their washing facilities are but moderate. Individual susceptibility appears to play a great part, for my only patient suffering from bakers' itch had two previous attacks, one before and one since the war, and now showed an erythematous condition, of four days' duration, on both his hands, wrists, and forearms, with numerous follicular pustules of the epidermis, which, however, rapidly subsided with repeated fomentations. This man had always worked in a hand bakery, and handled only flour, yeast, and salt, and no preservatives. He was of clean habits, and careful examination in bed revealed no other septic foci. He was very nervous, with glib knee-jerks and tremulous, sweating hands.

Sweets and sweet biscuits are manufactured near the hospital, and there are big sugar refineries close by. The only case of "sugar itch" I have seen was as follows:

A sugar warehouseman, J. P., aged 37, when first seen on May 13th, 1922, had an acutely red inflamed condition of both hands, fingers, and wrists; over the backs of his wrists were numerous linear breaches of the surface, and between the fingers the skin was sour and sodden. By May 25th this eruption had spread to the face and neck, but at the end of another week he was able to cease treatment.

Preservatives and Antiseptics.

The following case was indubitably due to a too zealous use of a stock disinfectant, which indeed the boy admitted:

A boy, aged 15½, had been employed as a barber's assistant for one week, and had been thoroughly lectured as to the necessity for the use of antiseptics. His hands were a bright pink colour, they sweated freely, and were covered on the posterior surface of both hands and fingers with innumerable close-set small clear vesicles; on the palmar aspect of the fingers the vesicles were fewer, and in the palms of the hands were only a few widely separated sago-grain-like nodules. The eruption subsided rapidly on the application of calamine liniment.

Paper that is to be sent abroad is almost invariably passed by a machine through a solution of formalin in water and glycerin; a 4 per cent. formalin solution is usually used. In January of last year my attention was called to a little outbreak at one factory employed in making such paper.

Mary S., aged 23, had been at this work for two years, and says that she has had a rash on and off ever since she was so employed. She *alternates* on this employment, one week on and two weeks off, but during the off time wraps the finished rolls in paper and so is still exposed to formalin, though to a less degree. There was a coarsely papular rash with apical scabs profuse on both wrists behind, together with bad perionychia of the right middle finger and a little about the thumb and middle fingers of the left hand. Ethel C., aged 21, had also tended this process for two years, and alternated, as did all the girls employed on this particular work. There were numerous fissures in reddened skin over the joints of her fingers and thumbs, with a very little reddening about the bed of the right thumb-nail. There was much redness, fissuring, scaling, and slight scalding between all her fingers. When seen at the factory her sister showed a milder similar state, and three other girls showed mild cutaneous reactions to their employment—that is, cracking of the skin, soreness of the backs of the hands, or cracks beside the nails.

The inveteracy of formalin dermatitis, and the extraordinary sensitiveness of the skin to this agent once a reaction has been established, is well known by experience in their own person to all histologists. The most careful attention and cleansing of the skin, the application of emollients, the early abstention from all contact when the skin is affected, is a method of relief that should be urged by all doctors who meet with such cases in their industrial practice. At the factory, girls with moist soft palms seemed to experience no trouble, whereas Ethel C., the worst affected, had had a dry ichthyotic harshness of her palms and soles from birth. Ethel C., removed from work and given calamine liniment and a zinc ointment, was well in a month.

G. C. described himself as a "chemical worker," but on further interrogation said that it was his duty to make and fill barrels with a solution of SO_2 in water for sale to fruit preservers. He showed on both his forearms, on the backs of his hands, and to a much less extent on his face and neck, very irritable close-set pink follicular papules of varying size with a little cracking and soreness of the large folds of the palmar skin. His hands were sweating very freely, a point of clinical moment in similar cases arising in dye workers and in the explosives industry.

Oil Dermatitis.

I would preface my remarks on oil rashes by short notes on three recent cases I have seen.

1. G. B., aged 32, is a die and staple maker. His lesions had only troubled him for two days. Both his forearms showed numerous but discrete red papules, many of which have black plugs in their centres.

2. C. O., aged 38, was a skilled tool-setter. He showed several discrete indolent boils on both his forearms of three months' duration; this (May 25th, 1922) was his third attack; previous similar attacks had dated fifteen and eight years previously.

3. L. T., aged 24, was a motor fitter. He came to the hospital first in July, 1920, with boils on his forearms, and the occupational factor was overlooked. He relapsed and came again in November, 1921, with large indolent follicular pustules on both his forearms and extending a little way up his arms. There was slight acne of the face without pustulation.

The distinctions between soluble oils, cutting compounds, cutting emulsions, and cutting oils are technical and need not detain us—they are fully set out in a memorandum of the Department of Scientific and Industrial Research in 1918—save that in the "cutting compounds" free alkali up to 2 per cent. of caustic soda may be present. These substances are used by the hundred gallons in engineering workshops for cooling, lubricating, and cleansing purposes. A report by my assistant, Dr. J. B. G. Skelton, will show how essential it is to have an insight into actual factory conditions in order to come to any opinion whatever as to the causative factors in oil dermatitis—uncleanliness, mechanical injury, and the oil itself all being intertwined. I would like particularly to call attention to the washing arrangements.

"I visited this factory on account of a report from the manager that cases of dermatitis were occurring there. The first two cases that I saw were typical scabies, and the next was a typical impetigo contagiosa. All the other cases consisted of a diffuse erythema over the backs of the hands, between the fingers, and on the under surface of the forearms and elbows. All these cases were occurring in girls cleaning shells with a turpentine substitute, and a diagnosis of oil rash had been made. The girls complained of much irritation and itching of the hands and between the fingers. On examination there was a diffuse reddening of the skin over the backs of the hands and between the fingers, and in some cases along the under surface of the forearms and elbows. The hands and arms of the workers were covered with the dirty oil, and in this oil was embedded a large number of very fine steel filings, easily seen with a lens, and which had been washed from the shells during the process of cleaning with the turpentine substitute. The hands, arms, and in some cases the legs of these workers were covered with oil, and a few had marked dryness of the skin over these areas. The turpentine substitute used contains spirit, but no exact analysis was obtainable.

"I think that there are two factors in the production of these cases: (1) a dryness of the skin due to the spirit in the turpentine substitute, and (2) the irritation and minute abrasions caused by the steel filings which are held on the skin by it. The erythema around the elbows and forearms is accounted for by the girls leaning while at work and thus rubbing in the fine steel particles.

"I saw one case where the skin of both palms and the backs of the hands had desquamated, preceded, so I was told, by the original irritation and redness. At this factory 850 workers are employed. The medical arrangements are looked after by a local doctor, who goes to the factory when required. No preliminary examination is made, and records of cases are kept in book form. The welfare and nursing arrangements are looked after by Miss D., who has under her three nurses.

"In attempting to deal with these cases the washing arrangements are of first importance. There are 21 washbasins in the factory, and roller towels, which were extremely dirty and oily; also there is no soap kept in these washhouses. Tins of antiseptic soap are given to the workers, who are expected to bring them daily. I was told by the welfare supervisor that a very large proportion of the girls do not bring this soap, so that the washing, in a large number of cases, consists of holding the hands under a stream of water and then wiping them on the roller towels. In addition there are three

baths, originally built for the foundry men, but which can be used by the girls on special days during the week. I was told that these were well patronized."

Of another engineering factory I have a note:

"The cases I saw were of one type—namely, follicular impetigo affecting the hair follicles over the hands and forearms and in some cases the legs. The arms and hands of these workers were coated with oil and in this oil were embedded large numbers of steel particles (July, 1917). The oil used is very dirty and is only changed about every two weeks. For 360 girls 10 washbasins and 6 very dirty roller towels are supplied. There is no washing accommodation for the men and boys; some of the latter aged 16 work ten hours a day and cannot wash through this period. As the factory conditions seem to me so important in the consideration of oil dermatitis, may I add a third note I made at still another engineering factory?

I visited this factory on Wednesday, September 19th, 1917, to investigate a complaint of poisoned arms among men working on greased wire ropes. The trouble complained of originated in a room about 25 by 10 yards, in which are four (there will be eight) wire-winding units. These units consist of a drum holding a supply of twisted iron wire, which is passed through a box full of a mixture of oil and graphite and then wound on a second drum. Two men are usually at work on each unit hammering and pushing the wire into good alignment and working the various levers. Twenty-five men all told work in this room, and their hands and arms are all covered with this oily composition. Their clothing is protected by boiler suits and mackintosh aprons. There is no washing accommodation for these men. I examined two men at work.

(1) William D., aged 21, had a whitlow on the left forefinger of a week's duration. (2) Frank S., aged 35, had an indolent boil 2 cm. across on his right wrist. Both these cases were badly dressed with soiled rags; metallic particles could be seen in amongst the grease on their forearms and hands. The wire arrives more or less greased from various sources.

It is difficult to find words strong enough to express the lamentable state of the washing and lavatory accommodation for men here. That for the women has been well designed, is conveniently situated, and is sufficient. It consists of a special building with trough and basin facilities for forty workers, under the special charge of one woman, and in addition in the shell-case-making department is a room where five tin basins are supplied on a leaden shelf; but for the 200 and more men employed at this factory a bucket of water is brought up to the wire-rope-winding room, and one basin is provided in the watercloset shed. There is a row of six watercloset, two only with doors, that suffice for the working staff of this factory. They are situated in a dark lean-to with a muddy earthen floor. For the male office staff and 18 inspectors one watercloset suffices.

In another factory (A. T.) there were in one year twenty-six cases at least of oil dermatitis, three of which developed cellulitis. An irritating erythema, follicular pustulation, acne, and multiple symmetrically distributed indolent boils may result from work involving continuous exposure to oil. It is remarkable, however, in children how few rubbings with camphorated oil will produce grouped comedones with pustulations on the chest, and I have seen an elderly gentleman whose head was covered by large close-set comedones, due to the application for seven years, morning and night, of a pomade he had sent over to him specially from Nice to London.

Dr. McLachlan, in a paper in the *Glasgow Medical Journal* of April, 1922, draws attention on page 217 to the ease with which these cases may be missed; up and down the country they must be overlooked in scores to-day. If work is suspended these cases get well quickly, otherwise it is the experience of many that they are most rebellious to treatment. Dr. McLachlan stresses, and I most emphatically agree, that "the workers' habits are themselves a danger."

Occupational Tinea.

Of these I have seen but two noteworthy cases.

R. S., a labourer aged 47, works at the Victoria Docks unloading hides, and he was sent to the London Hospital by a local practitioner as a case of anthrax. His lesion has existed for fourteen days and when seen was a ringed reddish eruption about 1½ inches in diameter over the base of the left thumb. It was a definite case of tinea circinata—the fungus was found in scrapings.

The case of C. M., aged 36, is a little more startling, however, for he is a barber in the active practice of his art, and he is known to us to have had tinea of his finger-nails since at least 1915. Three nails are affected on his right hand, and only since suppurating onychia has developed have we been able to remove even his right thumb nail.

Some barbers are greatly troubled by stiff short hairs working under their nails, and find that if these hairs are not pulled out daily with tweezers suppuration quickly follows. On mentioning this to a large farmer recently he took me to see a labourer who cuts up haystacks and stacks of straw and in so doing frequently drives fragments under his nails or lacerates the nail margin. To obviate this he wears leather thimbles when he thrusts his hand through the stacks.

Tar.

"Epitheliomatous ulceration due to tar and pitch, bitumen, mineral oil of paraffin, or any compound, product, or residue of any of these substances" was made compulsorily notifiable to the Home Office in November, 1919. The tar industry is essentially a healthy one, and a far larger proportion of grey-beards are found in this industry than in any other I know. I have seen tar cancer develop in the following occupations:

Pickling telegraph poles.	Chemical factory labourer.
Tar distilling.	Gasworks labourer.
Pickling sleepers in creosote.	Pitch bed breaker.
Gasworks stoking.	Barge loader.
Anthracene labourer.	Road sprayer.

I have reviewed all the cases that have occurred at the London Hospital since 1903 to August, 1920. The parallel between tar carcinoma and *x*-ray carcinoma is close and striking. In both, years of occupational exposure are the rule, in both the end is a squamous-celled carcinoma, and both may show, singly or combined, pigmentation of the skin, multiple telangiectases, small keratoses, warts, and often multiple cancerous lesions.

All tar and pitch workers complain of irritation of the skin on washing, and owing to this the older worker in the tar trade is generally a rather dirty fellow; some men will apply whitewash to their face as a protection before commencing the day's work. The tar warts, histologically, are always carcinomatous; warts the size of a pea show epithelial down-growths with cell nests; yet for years they show a very benign character, having a natural tendency to fall off, leaving white, clean, pit-like scars. It is the habit of many workers to carry about a lump of soda and spit on it and rub it on their warts—when they remember them. Ten to forty years of employment in tar are needed to bring on these epitheliomatous changes, and warts may precede the appearance of any obvious carcinomatous ulcer by anything from two to twenty-five years. The ages of men affected with tar cancer varied in my collection from 33 to 75 years of age, and a feature of interest which I cannot attempt to explain is the latency that these cases may show. I can best illustrate this by an example. T. L., aged 68, had been a railway booking-office clerk for twenty-eight years past; for twenty-eight years before this he had been employed as a gasworks labourer; for the last two years he had a wart on the left side of his scrotum, which grew slowly and was excised as a carcinomatous ulcer in 1908. Bland-Sutton (*Tumours Innocent and Malignant*, 1917, p. 215) mentions a case of soot cancer with a similar clear latent period of thirty-five years.

In order of frequency the sites on which these lesions form were face, scrotum, and forearm, and all sites may be affected in the same patient. I have said that these lesions have a very low grade of malignancy; in a paper on this subject in the *British Journal of Dermatology* in 1920 I stated (p. 14) that in no case had secondary deposits been found in the regional lymphatic glands removed at operation. This year, however, in a case of tar epithelioma of the scrotum, the lymphatic glands were enlarged in both groins, and after the removal of the primary growth continued to enlarge, and one ulcerated through the skin and has every appearance of secondary carcinoma. These tar carcinomata respond extra-ordinarily well to radium; a growth the size of a shilling will generally disappear after a single sitting of two hours' exposure, though it is advisable to repeat this in six weeks' time. In all respects, save multiplicity of cancerous lesions, anthracene workers carry the same liability and the same favourable prognosis as workers in tar and pitch; these workers need supervision in order that their lesions may be treated in their early stages; to secure this result a quarterly short visit by a practitioner to every tar factory would ensure that no cases were allowed to run on and become incurable. Tar cancer, as far as present knowledge goes, is not preventable, but should not kill.

Dyes.

Of dye dermatitis we see far too many cases. Mostly they occur in young workers, the ages of our last six cases being 28, 18, 19, 20, 24, and 40 years of age. They are fur sewers, fur dyers, or fur dealers. The causal agent is suggested at once by a glistening deep brown staining of their nails and of the pads of their fingers; sometimes the whole hand is brown in colour. Generally their palms are moist and show free perspiration; the lesions produced vary from a general erythema with raised red follicular papules to a gross pompholyx eruption on the palms and fingers with concomitant fissures, impetiginized erosions of the cuticle, and acute perionychia. Subjective symptoms are slight, and if the patient will refrain from work a rapid recovery on simple treatment is the rule. It is not uncommon when the hand lesions are in an acute phase to see an eruption on the face and neck in the form of sheets of scaling erythema. It is difficult to account for the onset of these symptoms except by supposing that after repeated assaults the threshold of tolerance of the cuticle becomes lowered, for many of these workers have been in the industry for from three years upwards. The source of the dye may vary, but never is a whole workroom laid out at any one time.

Susceptibility.

In establishing any new industry having its own health hazard a largely immune body of workers can be secured by eliminating persistently at the first onset of symptoms every worker showing signs of intolerance. A. H., an unskilled labourer aged 32, was employed by a local foreign employer in a small way of business for a week on staining wood with potassium bichromate; the next week he came to us with the stained, ulcerated, and inflamed condition of his hand as shown in the photograph (Figs. 2 and 3). He said that in the last three months twelve men had been sacked by his master for the same misfortune. This sounds ruthless, but, if this stain is to be used, those with susceptible skins must be eliminated, and men who by skill, cleanliness, and extra tolerance can stand this work will stay by this industry. On a large scale this experiment has been worked out in the manufacture of tetryl at Waltham Cross, near London, and at Queensferry, near Chester. At Waltham Cross factory tetryl, a high explosive, had been manufactured for years before the war and had acquired a set of immune skilful workers. Queensferry was started during the war with unskilled labour; its preventive welfare and medical care reached a very high standard indeed, yet the incidence of tetryl dermatitis was appallingly heavy so as to lead to grave difficulties in the obtaining of labour and in appeasing the workers with "danger money" that satisfied their appreciation of the risk to health and limb that they were running. Every new industry has at first a heavy industrial casualty list.

A skilful worker can do a piece of work in much less time and with less distribution of noxious material on himself and on his surroundings than a newcomer to a job; hence it is that adequate instruction in correct methods of work is in itself a great preventive measure against industrial ill health of many kinds. Complete protection is assured when by inventive genius and engineering skill all hand contact is eliminated.

I have collected these cases from many sources, and I owe more than I can express adequately to the assistance and consideration of Dr. J. H. Sequeira.

The chief lesson that I would like to press home is the ever-present need of being alert for an industrial origin in cases of dermatitis of the hands and face; and secondly, that there is little or no specificity in the skin reactions—erythema, pustulation, perionychia, powder holes, and carcinomata may each be due to varied industrial causes, and until the etiological aspect of every case is adequately realized curative and preventive medicine are alike impotent.

DISCUSSION.

Dr. T. M. LEGGE (Chief Medical Inspector, Home Office) said he had been helped by a classification (for which he did not claim any originality) of the causes of industrial dermatitis as due to (1) certain chemical substances like potassium bichromate, arsenious acid, and certain finished dyes; (2) substances which soften and macerate the skin, such as alkalis; (3) substances which dissolve and remove the natural grease from the skin, like turpentine, petroleum, benzine, benzene and its homologues, and their nitro and amido derivatives; and (4) processes which mechanically injured the continuity of the skin, such as brushing, scratching, and rubbing. In the prevention of these on factory premises much more medical supervision was desirable to prevent secondary infection. With the substances which dissolved the natural fat from the skin he believed in the attempt to restore, as far as possible, the natural lubricant, by the use of an ointment of equal parts of lanoline and castor oil after the work of the day had ceased; and in dermatitis due to unavoidable dust in the air, by the use of powders rather than ointments while at work, so as to introduce a mechanical obstacle against the alighting of the injurious dust. He referred to the specific effect of pitch, tar, and paraffin in setting up irritation of the skin which eventually might become malignant, and to the absence of such effect in the manufacture of bichromates and their use in dyeing and tanning, which also set up intractable ulceration, but showed no tendency at all to malignancy.

Dr. NORMAN WALKER (Edinburgh) said that he had long been interested in occupational dermatitis. It had always been his practice to inculcate on all students the necessity of ascertaining the exact occupation and work of all patients complaining of "eczema." He desired to say how much we had gained by intelligent co-operation with the Home Office. Intelligent co-operation between the workmen and the doctor was also highly desirable, and in certain instances had been very successful in avoiding and preventing the dangers associated with the paraffin industry. In other cases where that co-operation had been lacking these dangers had been much more real and had led to serious disasters. He had also been much impressed by the idiosyncrasies of the skins of different patients, some of whom were sensitive to one thing and some to another. He considered this idiosyncrasy a factor of great importance, and he believed that any idiosyncrasy once developed remained permanent for the individual affected. The best fat or grease for use in preventive treatment was also a matter of idiosyncrasy—some did best with lanoline, others with olive oil.

Dr. FREDERICK GARDINER (Edinburgh) had also been interested in this subject for a number of years. He had found that of all the cases of dermatitis seen by him at least 66 per cent. were cases of occupational dermatitis, but in 14 per cent. the dermatitis was preceded by a definite illness, and 63 per cent. showed a preceding abnormality of the skin—for example, seborrhoea, hyperidrosis, or psoriasis—which no doubt made it more sensitive to the action of the irritant. He had found that slight alterations in the materials used would often cause an outbreak in a workman who had used with impunity for years a formula not very different from the one newly introduced. He had found that there were two types of case: one where the workman became affected as soon as he entered the works, the other where he became affected only after he had been engaged in his occupation for many years.

Dr. G. H. LANCASHIRE (Manchester) said that the possible sources of irritation were legion. He merely desired to mention certain out-of-the-way substances which had come to his notice. One of these was novocain, which he had found to cause dermatitis in a dentist. He did not know of another case of the kind in this country, but it had been previously described in America. He had also seen two cases of "Inecto" dermatitis in barbers. Although it was common enough among women or men who dyed their hair, these were the first cases he had known among barbers.

Dr. KENNETH WILLS (Bristol) said that he had had exceptional opportunities of observing linseed oil dermatitis, because the Bristol Infirmary was next door to a linseed oil factory. It was a not uncommon idiosyncrasy. He quoted a remark by Dr. Palmer that it was marvellous how dirty people avoided skin disease; he felt sure that anything tending to dry the skin and make it crack made it more liable to dermatitis; hence he deprecated too much washing. He was interested in the case of barley itch described by Dr. O'Donovan because he had himself met with a small epidemic of barley itch among men employed in unloading a cargo of barley. He had found that it was due to the barbs of a certain weed which had got mixed up with the barley. One other interesting and unique case he had noticed—that of a man whose hands were sensitive to hemp.

The PRESIDENT (Dr. Leslie Roberts, Liverpool) said that many important points had been mentioned by the previous speakers, and he hoped that they would be able to draw some general conclusions from the discussion. For himself, he was of opinion that there was no such thing as a local disease, although there might be a disease confined to a small area. The cause of these eruptions he regarded as twofold: (1) A defect in the external defence—in other words, a defect in the keratin membrane of the skin, which therefore ceased to be a complete protective organ. (In this connexion he desired to emphasize the importance of examining the whole surface of the skin in any patient suffering from dermatitis.) (2) The personal idiosyncrasy of the patient, which he considered chemical. The introduction of foreign proteins into the body from various septic foci was an interference with the chemistry of the skin and reduced its resistance. Also foreign carbohydrates of the di- and poly-saccharide types, ingested with the food, might, since they did not enter into the normal sugar metabolism, sensitize the skin to certain irritants. Hence he thought that the question of diet might form an important part of the preventive treatment of dermatitis. He did not agree with the use of ointments as advocated by Dr. Legge.

DERMATITIS ARTEFACTA.

BY

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A RECENT survey of the literature on this subject leads me to think there may be points still worthy of discussion. Moreover, a more complete type classification may be attempted, and a clearer line of treatment indicated.

In this brief paper I shall exclude the ordinary forms of malingering practised for a definite and reasonable object—evasion of army service and the like—and also cases, of which we have all seen instances, where a man or woman seeks to defraud the Workmen's Compensation Act. As a subdivision of this class may be placed those, of whom I have seen several examples, who artificially stimulate a genuine eruption so as to prolong their stay in hospital. These acts are sane, if immoral, but in the dermatitis artefacta we are considering the bulk of the subjects are approaching or have reached the border-line of insanity.

A fair proportion of the subjects are hysterical, and may show the usual stigmata of that condition, but a number of cases that I have seen have not been of the hysterical or even neurotic type. They have not had the facies or manner suggesting any departure from the normal, and some have even discussed their skin lesions with an engaging frankness that was no doubt meant to be most disarming. On the other hand, the subject may have a sullen expression, with furtive and hang-dog manner when interviewed. The point I wish to make is that manner and expression in these people are not to be relied on for diagnostic purposes in the same way that one relies upon them in other psychopathic conditions.

In a number of cases, as is well known, the suggestion of self-mutilation has come to the patient in the first instance during a genuine attack of skin disease, which has furnished lesions to be copied. No doubt a higher percentage of these cases would be noted could they be seen or traced from the beginning.

I would suggest, as a psychological attempt, the following classification of cases:

Class 1.—Composed in the main of hysterical subjects who mutilate themselves with the definite object of exciting pity and gaining notoriety of sorts. This class comprises individuals who are prepared to go to the utmost limits of their endurance in order to keep up appearances, and some of the worst examples of self-mutilation belong to it. The most extreme case on record is described in *La Presse médicale*, June 10th, 1908:

It is that of a man of 30 who produces black gangrenous patches on his arm by the use of caustic potash. He consults fifteen doctors in turn, and preserves their names and diagnoses, which include trophic skin trouble, neuritis, myelitis, hysteria, syphilis, tubercle, spontaneous gangrene, and so on. He has various treatments, including stretching of the brachial plexus, and finally consents to amputation of the limb. The remaining arm subsequently becomes affected, and about this time he arrives at Professor Dieulafoy's clinic, where the real condition is recognized. The professor talks to the man on sound lines and he is cured.

I believe that with proper handling the prognosis in cases of this class is good.

Class 2 includes a more irrational type, where the motive is indeed hard to find. These people would appear to suffer only to please themselves, and to find a morbid satisfaction in contemplating their own infirmities. They make no effort to secure the pity of others, and are content to play to an empty house. Some of them come definitely within the province of the alienist, and in most cases the prognosis is bad.

Class 3.—In this class motive again would appear to be entirely absent. The patient is not anxious to pose as an invalid, but on the contrary would generally appear ashamed and distressed by the appearance of lesions. There is an entire absence of the self-satisfaction shown usually in Class 1. These cases, of which I have seen several examples, appear to be examples of obsession and sudden uncontrollable impulse. I will briefly quote one instance.

A young lady was brought to me a few years ago by her parents. Her face and neck were much disfigured by oval-shaped excoriations and crusts, all in the same stage of evolution and obviously suggesting factitious dermatitis. The young lady was a professional musician, a hard worker, and anxious for success. I learned that she had had repeated attacks of the eruption, and that these appeared always on the day she was billed to appear at a concert. In a private interview she confessed to me that some uncontrollable impulse made her mutilate herself in this way on the very day that would prove most disastrous for her.

There would appear to be in this type of case something akin to the impulse which drives certain people to jump from a precipice. I find, too, that the victim is relieved when the secret is shared by the doctor, and that subsequently the cases have done very well.

Class 4.—This class has not, I believe, received attention before. I will illustrate it by a recent example.

A young lady, a governess in a private family, was sent to me by her medical man suffering from an eruption on the face and neck, which it was feared might be contagious. The lesions—oval and linear excoriations—appeared to be self-inflicted, and I learned that they were produced by rubbing the skin. I may add that the patient herself appeared quite relieved when she was able to make the confession, for which she had never been asked before. She told me that the rubbing was a pure "habit" and not done with any wrong motive—indeed, she would be very glad to be cured of the practice. After full inquiry I came to the conclusion that this was indeed a simple case of a habit to be placed in the same category as nail-biting.

Diagnosis.

The diagnosis of dermatitis artefacta may be easy or otherwise, according to the skill which the patient has used. People of a low order of intelligence commonly manipulate in the clumsiest fashion, and there is no difficulty in recognizing the hand-made article when one sees a fresh lesion from which a gravity-made streak of corrosive fluid is depending. On the other hand, one sees artefacts which are extremely difficult to certify, and there may be about them merely an undefinable something which rouses one's suspicion. These are, of course, cases which must be carefully watched—perhaps with the skin under a protective covering—before a pronouncement can be made. The main points of diagnosis include the history of the patient and the case, the distribution, shape, and character of the lesions, and especially their uniformity. Suggestion to the patient of a new site for the next eruption is also a useful guide.

Although one sees cases in which chemical irritants and corrosives have been used—acids, alkalis, and so on—in some cases the mildest irritant seems to suffice. I have seen eau-de-Cologne produce alarming lesions in one lady, and this probably points to a predisposition, psychic in origin, on the part of the skin. Many cases are the result of simple rubbing, as we know, and it is probable that the same amount of friction in a normal skin, with a normal mind behind it, would give negative results. To pursue the same line of thought, one is reminded of the Nancy experiments where under hypnosis suggestion alone produced eruptions. In fact the whole question is one perhaps more for the psychologist than the dermatologist when once the latter has pronounced his diagnosis. I have referred it to Professor Pear, the distinguished psychologist at Manchester University, who, while much interested in the subject, reports that as yet it does not happen to coincide with the lines along which he has accumulated any special knowledge. He writes:

"From a psychological point of view the interest is, of course, in the nature of the motive, or combination of motives, which bring about the production of such an unpleasant experience. . . . It seems to me quite certain that the motive is of a nature more

complex and probably different in quality from those which actuate an ordinary person. It is quite probable that the whole problem is susceptible of illumination by psycho-analytical methods, and it would be extremely interesting if a dermatologist and a psycho-analyst could co-operate in a case of this kind. Beyond mentioning this I am afraid I have nothing of value to contribute to a subject which interests me very much indeed; except, of course, the reflection that the eternally returning problem of the line between functional and organic is raised again in a very challenging form."

Pernet, at the annual meeting of the American Dermatological Association in 1909, suggested that in some cases of dermatitis artefacta there might be a "dual personality," the patient in his normal state being unaware of his delinquencies. I do not know how far this suggestion may be considered fantastic, but quite recently I saw a lady whom I had attended twenty years ago for this condition, and who still bears many disfiguring scars as a memento. She told me that she had not the slightest recollection of ever mutilating herself, though at the time she used a powerful caustic, producing deep and painful ulcers. I give you her statement for what it is worth.

It is unnecessary to labour the importance of being sure of one's diagnosis. At the meeting of the American Dermatological Association (1909) already referred to, Duhring commented on the few cases he had seen, but recalled cases which had been wrongfully labelled as dermatitis artefacta. My own impression is that probably more cases are overlooked than recognized. As would be expected, more examples turn up in private than in hospital practice, since the condition is more apt to accompany an aimless and idle life in pampered individuals.

Treatment.

As regards treatment I find no unanimity of opinion here. Ormsby (*Journal of the American Medical Association*, November 6th, 1915) does not advise confronting the patient with the charge, but telling her that there is no question whatever of the cause and instructing her as to dressings, etc. In lieu of expert treatment by the psycho-analyst, of which I have no experience, it appears to me that the only commonsense and honest procedure is to tell the patient, in private, that he or she is found out. I believe a *laissez faire* attitude, which, of course, is an easy one, is far too commonly practised. Nevins Hyde said he had always failed to secure a confession from the patient. That has not been my experience; indeed, in some cases relief has been expressed that the secret has been discovered. It would certainly be wrong to publish one's knowledge to the patient's family and friends, and such a course has been known to lead to suicide. But a pact may be made between doctor and patient which should offer success. At times a threat is justifiable—that should the evil practice not cease the parents or others would be informed; this I have seen effective. In this by-way of dermatology there is the greatest call on the doctor's tact and psychological powers, though, as we are all aware, these attributes are by no means needful only in the case of dermatitis artefacta.

ALOPECIA AREATA AND STRABISMUS:

A FAMILY GROUP OF CASES.

BY

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A SERIES of cases of alopecia areata occurring in one family has come under my notice during the last few years, presenting points of interest which appear to justify my making this contribution to the proceedings of the Section of Dermatology.

The family, the majority of whom reside some twelve miles or so from Glasgow, consists of eleven members—father, mother, and nine children. I have seen seven of them. Of the remaining four, two children, both adults, are inaccessible, having emigrated to Canada; the father and one son have not yet responded to my invitation to appear for examination. The following is a very brief history of those members whom I have seen.

Case 1.—Mrs. A., aged 49 years, states that she has suffered from "bilious headaches" all her life. At about 9 years of age a bald patch appeared in the occipital region, as nearly as she can remember, and extended to the whole of the scalp. She remained bald until 15 years of age. The hair then grew again spontaneously. About five years ago a bald patch developed in the occipital region and in both parietal regions, which quickly cleared up under ordinary local medication. On April 30th, 1921, I have this note: "Hair is generally thin, especially over left parietal area. Eye and knee reflexes appear to be normal." Since the age of 40 she has suffered from intermittent increased frequency of micturition. In April, 1921, she was under treatment for "no feeling in hands and head."

Case 2.—Son, aged 19 years. At about 10 years of age a bald patch appeared in the upper occipital region, and extended to the whole of the scalp. He remained bald for four years. After prolonged treatment with the vacuum electrode the hair regrew, save on a small area in the occipital region, which still remained bald on June 21st, 1922.

Case 3.—Daughter, aged 16 years. At about 8 years of age a bald patch appeared in the occipital region. She lost almost all her hair for two years. After ordinary local medication and prolonged treatment with the vacuum electrode the hair regrew and remained for about four years, when two very small bald patches developed. On June 21st, 1922, she appeared to be cured.

Case 4.—Son, aged 13 years. He is a somnambulist, and talks in his sleep. At about 9½ years of age a bald patch appeared at the vertex and extended to the whole of the scalp. Ordinary medication and finally the vacuum electrode were applied. All the hair regrew, but on June 21st, 1922, there had been some relapse.

Case 5.—Son, aged 10 years. At about 9 years of age a bald patch developed at the vertex and several other bald patches followed. Ordinary medication and the vacuum electrode were applied. On June 21st, 1922, there was still some evidence of the disease.

Case 6.—Daughter, aged 29 years. Has never had bald patches. There is a small traumatic cicatrix in the right parietal region.

Case 7.—Son, aged 7 years. No history of bald patches, but when seen on June 21st, 1922, a small area in the right occipital region showed hair of lighter colour and possibly of weaker growth. I am informed by the family doctor that a bald patch subsequently developed.

It will be observed that the disease appeared, in the majority of the cases, in the occipital region. This, however, is based mainly on the mother's evidence, as is the incidence of the affection at from the age of 7 to 10 years.

Mrs. A. states that she has a married son, aged 21, whose hair is thin, but he has never had any bald patches; another son, aged 26 years, whose hair is thin, is in Canada; and a daughter, aged 23 years, who has a good head of hair, is also in Canada. Mr. A., aged 50 years, has never developed bald patches. The family doctor states that none of the family has been under treatment for tonsillar hypertrophy or for postnasal adenoids.

Hairs from the scalp in Cases 1, 3, 4, and 5 were microscopically examined by Dr. G. Haswell Wilson of the University Pathological Department, who also attempted to make cultures on Sabouraud's medium, but failed to discover anything microbic or mycotic by either of these procedures.

It was noticed that several of the patients squinted, and as many members of the family as could be induced to attend the Glasgow Eye Infirmary were examined by Dr. W. Hislop Manson, who kindly reported as follows:

1. Mrs. A., aged 49, strabismus convergens, right.
2. Daughter, aged 16, strabismus convergens, right.
3. Son, aged 13, strabismus convergens, alternating.
4. Son, aged 10, strabismus convergens, right.
5. Son, aged 19, strabismus convergens, left (occasional).
6. Daughter, aged 29, strabismus divergens, right, cum myopia.
7. Son, aged 7, no evident strabismus, but mother states he occasionally squints.

Note.—Nos. 1, 2, 3, 4, 5, 7 suffer or have suffered from alopecia areata. Nos. 1, 3, 5 were completely bald. No. 2 was almost bald.

The first five of these cases have been under treatment for alopecia areata. The sixth has never developed it. The seventh, when seen by me on June 21st, 1922, showed a light-coloured patch of possibly weaker hairs in the right occipital region. I am informed by the family doctor that this seventh case has since developed a bald patch, presumably on the light-coloured thin area just mentioned.

Mrs. A. states that of the remaining three children, one, a married son, squints a little and has thin hair, but no bald patches; another adult son has thin hair, but does not squint; the third, an adult daughter, has no squint and a good head of hair. The family doctor states that Mr. A. has no eye affection except presbyopia, for which he wears + glasses.

From these records it appears that eight of the family, including the mother—and this might indicate an hereditary factor—have shown a pathological condition of the hair, which in six assumed the form of alopecia areata. Seven of these eight persons are strabismic. Mrs. A. states that her last five children are very nervous. All of them developed

alopecia areata. Mrs. A. also says that some of the children did not squint until after beginning to go to school.

Is there a causative factor in these cases common to the two conditions, strabismus and alopecia areata? It might be advanced that their association is merely coincidental. If so, it is certainly coincidence on an unusually grand scale.

With respect to the microbic theory Dr. G. Haswell Wilson's negative findings are against it. Also, were this family scalp condition contagious and the mother the source of infection, one would have expected an incidence earlier than the age of 7 to 10 years in the affected children, and also that the remaining children and the husband would not have continued immune.

In discussing these cases with Dr. Hislop Manson he agreed that the percentage of squinters in the family was large, and stated that the greater strain upon the nervous mechanism controlling convergence and accommodation, after beginning to go to school, might account in some degree for the development of squint where it was deferred until that time. One of the theories of squint is that the equilibrium between the powers of convergence and accommodation is disturbed. These powers are dependent upon innervation.

It will be recalled that there is a possible maternal hereditary influence operating, and also that Mrs. A. suffered at one time from "no feeling in the hands and head," as she described it; also that five of her children are very nervous, one being a somnambulist. All of these squint and have suffered from alopecia areata. Possibly further investigation might elicit other neurotic symptoms.

With evidence such as this it would be difficult to exclude the hair affection from the picture produced by nerve disturbance. Indeed it is strongly in favour of its inclusion as resulting from involvement of the function of trophic nerves. There is possibly some physiognomical suggestion of congenital specific disease in the mother, but I am not aware of any faulty obstetrical history. I doubt if she would submit to a Wassermann test. What the ultimate cause common to these optical and cutaneous manifestations is, if such cause exist, I have as yet been unable to discover.

In conclusion, this group of cases appears to lend strong support to the important part played by the nervous system in the causation of at least some cases of alopecia areata.

My heartiest thanks are due to Dr. G. Haswell Wilson, Dr. W. Hislop Manson, and Dr. John Fotheringham for their very willing co-operation in making these investigations.

SECTION OF RADIOLOGY AND ELECTROLOGY.

LEONARD A. ROWDEN, M.B., C.M., President.

PRESIDENT'S INTRODUCTORY REMARKS.

DR. ROWDEN, after welcoming the Section to Glasgow, from whose university he had himself graduated some thirty years ago, said that there was so much work of real importance before the Section that it would not be right for him to occupy the time with any opening address. There were, however, a few points which he would like to mention for the future consideration of the members. Radiology and electrology had made rapid strides during the past few years and were occupying an increasingly important place in medicine. There was now hardly a single disease in which they were not of service in diagnosis or treatment. There was an ever-increasing demand upon these departments. The question was how such a demand was to be met. Would it be met by private enterprise, or by public institutions such as the large infirmaries, or by some scheme under the national health insurance system? He must leave that for the consideration of others, but he foresaw the danger of the almost complete extinction of the radiologist as a private consultant. The initial cost of plant and the cost of its efficient working were becoming so great as to be beyond the purse of the private practitioner. Another point for consideration was the status of the radiologist and electrologist. He thought that radiologists and electrologists should only give their services to those who were referred to them by other practitioners. He believed that there was a much greater tendency for patients to be referred to the public institutions, more especially by the honorary staffs.

DISCUSSION ON THE X-RAY TREATMENT OF DEEP-SEATED CANCERS,

WITH SPECIAL REFERENCE TO ERLANGEN METHODS.

OPENING PAPERS.

I.—J. R. RIDDELL, F.R.F.P.S.GLAS., L.R.C.P., L.R.C.S.EDIN.,
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THE essential differences between the Erlangen method and the older one in *x*-ray therapy lie in the facts that the object in the newer system is to attain homogeneity in the rays used, to administer an equal dose to all the diseased tissues, and to do so at one sitting. The quantity given is predetermined, and is such that it will destroy the diseased but not the healthy tissues; they will be damaged to a greater or less degree according to their *radio-sensibility*, but the quantity must be short of that which will destroy them.

Homogeneity is attained (1) by using rays of very high penetration (short wave-length)—the equivalent to a 16-inch spark-gap between blunt points in air, and (2) by filtration. The thickness of the filter depends to some extent on the apparatus used. For a gas tube and coils 0.5 mm. of zinc is employed. With a Coolidge tube greater thickness is necessary.

Much research has been carried out by several investigators independently to determine just what doses will destroy the diseased cells in various conditions, and the conclusions to which they have come are approximately the same.

The measurement of the dose is regulated by time, which means that the apparatus must be run under standard conditions; any change in the conditions would naturally alter the output, and consequently the time necessary to deliver a certain quantity. The unit propounded by Seitz and Wintz is that quantity of radiation which will produce a slight redness after a week and leave a slight tanning on the skin after a month. This is called U.S.D., and is taken as 100 per cent. On this basis the doses that have been determined are:

	Per cent.
1. To produce the menopause (called the castration dose)	34
2. To destroy sarcoma (the sarcoma dose)	70
3. Tuberculosis dose	50
4. To destroy carcinoma (the carcinoma dose) ...	110
5. To damage seriously the bowel	135
6. To damage seriously muscle tissue	180

The problem is to give the full dose to all the diseased tissues, and it is not always possible to do so. It means that the radiologist must attempt to visualize the location of the disease to its extreme limits and include all this area in the dose.

The rays in passing inwards from the surface lose in volume as the distance from their source increases; also they lose by absorption in the tissues through which they pass; on the other hand, they gain to some extent by the secondary radiation which they set up in the tissues. Obviously this secondary radiation will be greater with a large port of entry than with a smaller one. It is thus evident that the estimation of the dose arriving at a given point below the surface is a very complicated one indeed. It is still further complicated by the fact that each tube has its own "percentage deep dose"—that is to say, that two tubes may, to all appearances, be exactly the same, yet it is found experimentally that they do not give the same percentage at a given point beneath the surface; for example, one may give 17 per cent. and the other 24 per cent. To give the full dose to a carcinoma with the former tube it would be necessary to find seven ports of entry (and this would probably be impossible); while with the latter five ports would be sufficient.

The percentage can be improved by increasing the "tube skin distance"; thus a tube giving 15 per cent. at a point 10 cm. deep from the surface when placed 23 cm. away from the skin would give 26.2 per cent. if it were placed 100 cm. away. If at the first distance the time taken to give the "unit skin dose" were thirty minutes, at the last it would be nine hours.

The difficulty in determining how many ports of entry to employ, and at what angle to direct the beam of rays, is great. For example, suppose one is treating a carcinoma of the uterus, and determines to use four ports of entry at 35 cm. "target skin distance," and that each beam gives 26.4 per

cent. at 10 cm. deep—namely, at the centre of the tumour—that point would receive 105.7 per cent., which may be sufficient. But if the two beams from the front are so directed that they overlap at a point 3 cm. beneath the surface, this more superficial point will receive 136.75 per cent.

Now, if bowel happens to be there (and it is quite conceivable that it might be in a thin person) there is every likelihood of damaging it seriously—possibly producing ulceration.

I think I have said enough to show that while there are difficulties arising from the apparatus, such as the standardizing and keeping constant of tubes, the chief difficulty is so to arrange the skin tube distance, the number and sizes of the ports of entry, and the exact direction of the beams, that *all* the diseased tissues receive the full dose of rays, while none of the healthy tissues receive too much.

In the Frankfort clinic an ingenious instrument, known as the "field selector," has been elaborated. I have not seen it, but I imagine it should be of great assistance in this connexion. It is described in the *American Journal of Roentgenology* (June, 1922, p. 343) in the following terms:

"To make possible a graphic study of each problem we have constructed in the Frankfort clinic a device which we have named a field selector. This consists of a box illuminated with electric bulbs from beneath. Over it is placed a translucent plate of glass upon which are printed certain figures which are used as signals. They are printed in one colour with the different symbols in percentages of strength of colour. A drawing upon a glass plate representing a cross-section of the body and showing the location of the growth is now placed over the illuminated plate on which the symbols are printed. We have prepared a series of celluloid dummies representing beams of *x* rays produced at different voltages and through different values of filters at different distances from the body and of different dimensions of field, on which are shown by decreasing intensity of colour, starting with one hundred at the surface, the percentage depth dose at varying depths. These are stained with the same colour as the symbols printed upon the plate, and when two or more of these dummies are laid upon the diagram in such a way as to cover the lesion, one observes whether the different symbols are visible or whether they have become invisible when viewed through the superimposed celluloid films. The triangles disappear when 30 or 40 per cent. of the standard skin dose is reached in the colour values of the dummies. The quadrangles disappear at 60 to 70 per cent. of the standard skin dose, and the points at 105 to 115 per cent. The danger signals which are represented by the double dots should at all times be visible. When they are no longer visible, then the dose has exceeded 135 per cent. of the standard skin dose, and represents an amount of radiation which will cause a burn."

When the application is to be made to a part where it is not possible to irradiate from different angles—as, for example, the breast—the proper distribution of the dose is obtained by increasing the "target skin distance," thus reducing to a minimum the difference in density between the rays falling on the skin and those reaching the farthest border of the disease.

The necessity of giving the full dose at one sitting is emphasized strongly by Seitz and Wintz. They say that a dose sufficient to kill a cell, if administered at one sitting, is insufficient if it be divided over a number of days, as in the intervals the cell has time partially to recover, and, it may be, even to develop a certain amount of resistance or immunity. Considerable difficulty is sometimes experienced in getting the patient to lie quietly for the long time necessary, and no effort must be spared to have the patient thoroughly comfortable and resting in a relaxed position before beginning treatment. Sometimes vomiting sets in before the dose is completed and makes it impossible to give the full dose at one sitting. The question arises whether a narcotic should be used as a routine. It has not so far been my practice.

Of the patients treated for malignant disease between June, 1921, and May, 1922, 52 suffered from carcinoma and 8 from sarcoma. The parts affected were the breast, bladder, vulva, uterus, mouth, prostate, rectum, abdomen, larynx, neck, tonsil. It is unnecessary for me to say that the time is yet too short to speak of results except in the most tentative sense, but the immediate effects are very striking indeed, and I am of opinion that with greater experience even greater benefits will be obtained.

The results here reported are not so favourable as those reported from Germany. This is to be accounted for—at least in part—by the fact that in Germany patients are subjected to the treatment at a much earlier stage of the disease than in this country, and, owing to the longer time for which the method has been in use there, the operators are more experienced in the technique.

In the 16 cases of *disease of the breast*, whose histories I give below, the results are: In three the treatment failed entirely. In three there was great improvement (two have since died). In nine the evidences of the disease have disappeared—that is, in 56 per cent. all sign of the disease is gone at present; these were all severe cases. In two only there had not been a previous operation; the rest were recurrences, and all were inoperable. Of the 16 three should perhaps not have been treated; they were apparently hopeless from the beginning. Excluding these, the evidences of disease disappeared in 69 per cent.

Of the three patients suffering from malignant disease of the *bladder*, one should perhaps not have been treated, as she was too ill. The other two have greatly improved but are not yet well, both having suffered from a haemorrhage some months after the treatment was stopped. Both have had further treatment recently and appear to be well at present.

Of the five *uterine cervix* cases three should not have been undertaken on account of the extensiveness of the disease. (One of these was treated for the relief of pain only.) Of the two remaining one is apparently well, and the other very greatly improved. She is still under treatment.

Of the five *rectal* cases the disease was so extensive that complete recovery could not be expected, but three have very greatly improved.

Keeping in mind what I have already said regarding the shortness of the time covered by these notes, and the small numbers, and avoiding the use of the word "cured"—to use which under the circumstances would be unwise—I think a fair impression of the effects of the treatment in the cases reported may be got by tabulating them thus:

1. In 30 per cent. of all cases all evidences of the disease have disappeared.
2. If one excludes the cases that were apparently hopeless from the beginning the figure is raised to 41 per cent.
3. In 52 per cent. the benefits secured were very great in the way of relief from pain or discomfort, and of the patient being enabled to return to a more or less ordinary mode of life.
4. Excluding from the breast cases those that were hopelessly ill, 69 per cent. have shown complete disappearance of all evidences of the disease.

The author then gave detailed summaries of fifty cases, including breast tumours, malignant disease of the bladder, cervix, and rectum, and of the tonsils and larynx. He concluded as follows:

It will be seen that a number of cases were treated which appeared to be hopeless from the beginning, but these were undertaken, not with any hope of cure, but simply to relieve pain and the more distressing symptoms.

Finally, it cannot be too strongly insisted upon that it is impossible to attain any degree of success by this method unless one is prepared to spend much time and labour on details. The technique is difficult and requires constant attention. In the English translation of Voltz's valuable tables, edited by Dr. Reginald Morton, this point is emphasized, as the following extract shows:

"Probably the greatest danger to the future of the method lies in its being taken up by those who are unable or unwilling to give the time and skill necessary for its proper performance. The best results will be obtained only by those who devote themselves to this work to the exclusion of everything else."

II.—J. H. DOUGLAS WEBSTER, M.D.EDIN., CH.B., M.R.C.P.EDIN.,
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As has been shown by *x*-ray spectrum analysis, from the physical point of view our discussion is concerned with the use of a radiation of a wave-length over ten thousand times shorter than violet light, violet light being four thousand of the Ångström units of a ten-millionth of a millimetre (10^{-8} cm.). The waves we employ are 0.2 to 0.06 Å. U., so that one-half to one million of them could be contained in the diameter of a hair. Their half-value in water is 1.6 to 3 or more centimetres. They are obtained by different types and models of electrical plant, all capable of producing for hours on end voltages varying from 150,000 to 250,000 volts, and of *x*-ray tubes capable of a continuous output of from 1.8 to 5 milliampères at this pressure, the skin erythema dose at about 9 inches distance being given in from 40 to 15 minutes. With these *x*-ray tubes and a filter of 0.5 mm. of zinc or copper or other equivalent an emergent beam results, which by passing through successive layers of body density is not further altered in quality—that is to say, it is a beam qualitatively homogeneous. By the prolonged labours of the physicists Dessauer, Voltz, and their co-workers, we

now have accessible tables of quantitative intensity at different water depths, and with these tables, and employing or modifying the technique of radiologists who have used them for several years, we are now attacking the problem for discussion. This quantitative basis is one of the two advantages of the newer methods, the other being that with the higher voltages one can obtain 30 or more per cent. at 10 cm. depth, as compared with the 5 or 10 per cent. possible up to recent years; and thus for the first time we are enabled to direct sufficient radiation into deeply lying malignant structures. Factors such as scattered radiation have lately been analysed at length, and it is perhaps safe to say that at present deep *x*-radiation is on a more scientific basis as regards dosage, depth intensities, etc., than deep radium work is. The latter gives few approximately parallel rays, the loss by the square of the distance is a great factor in its use, and measurement of its depth intensity is very difficult. As Gudzent says, in radium work errors of 100 or more per cent. are easily made in the estimation of tissue doses. The quantities necessary are so large, also, as to be at present practically unobtainable. Gudzent estimates that for mammary, thoracic, and abdominal tumours at least 1 gram of radium element is required for satisfactory treatment, and the possession of this would only allow one case a day to be treated.

From the point of view of biological or experimental pathology all cells are affected by short-wave radiation, but in their sensitiveness they show a very wide sphere of variation. From bone and cartilage and muscle cells to lymphatic glands, bone marrow, spleen, and the chromaffin system is a twentyfold or more range in sensitiveness. Similarly in pathological tissues from osteo-chondrosarcoma and lipoma to lymphosarcoma there is an enormous difference in response. Tribondeau and others have pointed out factors which influence radio-sensitiveness—for example, nearness to embryonic type, the reproductive power, etc. The actual changes taking place in the cell are usually most seen in the nuclear chromatin, but also in the protoplasm, and in their essence no doubt they are physical, through secondary beta radiation and characteristic radiation from the iron and other materials in the body, and chemical through changes in the cell ferments and lipoids. Interest centres round the various so-called "doses" to cause definite changes in tissues such as the skin and intestines, to cause regression of tuberculous lesions, sarcoma, carcinoma, and the like, and to stimulate tissues to increased activity or growth. A large literature has accumulated dealing with these "doses" from both the clinical and the experimental points of view. The factors concerned are many and complicated. Of the "cancer dose" there is this to be said, that it is based on the frequently observed facts of cellular changes as a result of radiation; a cell at or near mitotic division is killed at once, while resting cells are destroyed after a latent period following a sufficient radiation. Professor Daels, at the recent London Congress, showed beautiful lantern slides illustrating these changes. But these observations carry several necessary presuppositions as to the condition of the tissues in which the tumour is embedded and the resistance of the whole organism, and if these are not helpful it appears that no amount of radiation will be "lethal" to the cancer cells. Krönig early noted the absence of response to radiation in cachectic patients, and Gustav Klein has found in these an absence of the usual "battle zone" bordering the malignant growth, where the presence of numerous lymphocytes and other cells constitutes a tissue reaction that seems necessary to recovery. How possibly to stimulate this local and general reaction in cachectic patients before radiation treatment opens up problems which the future may solve. Opitz says, in fact, that direct radiation alone appears unable to kill cancer cells. Kok, working with him, has exposed tumour cells from mice to ten times the "cancer dose," and the implantation material was only slightly changed in staining reactions, remaining unaltered as regards vitality. Even in the necrotic connective tissue in hyper-radiated tumour masses living and developing cancer cells can occasionally be found. From the biological point of view, therefore, the radiation response of tumours depends on four factors: (1) on the radiation absorbed; (2) on the sensitiveness of the tumour cells themselves; (3) on the neighbouring or interpenetrating connective tissue and other cells; and (4) on the whole organism. Hence the complexity of the problems of radiation and its effects, and of natural and induced immunity to cancer growth, and of refractory cases. Many are working on immunity lines, and though it is still too early to hope for much in the way of result from these lines as applied to man, it may be said that the very interesting work of Kellock, Chambers, and Russ at the Middlesex Hospital is showing in a number of cases very satisfactory results up to the present.

The complexity of the problems is not lessened when we look at the matter from the morbid anatomy point of view; for to the histologist it is almost as unilluminating to talk of "deep-seated cancers" as a group as to talk to an ethnologist of "Asiatics": the types of cancer differ much more from one another than, say, the Sikhs and the Malays! Ewing says: "It may safely be said that there are more distinct clinical and pathological entities within the groups of neoplasms than exist outside of them." "No one," he adds, "would think of confusing lobar pneumonia with pneumonic plague, though both are examples of acute exudative pneumonitis, but it is quite the rule to identify for statistical studies equally different forms of mammary cancer."

For advance to be made, therefore, far greater definition of terms than is usual should be employed in description of cases; thus, for example, each group, such as rodent ulcers or mammary tumours, should as far as possible be subdivided according to its histological type. Adler has attempted to classify tumours as to radio-sensitiveness and differing histological types, but his conclusions have been much criticized, Krönig and Friedrich, for example, saying that, if cachectic patients be ruled out, they have never found a carcinoma which was wholly refractory. Kehrer's method of radiating, and after a few days excising a fragment to ascertain microscopically the radio-sensitiveness, suggests itself as a useful advance in method, although of limited applicability. Pathologists are naturally sceptical when terms like "cancer dose" are used without qualification; "cancer dose" may be used as applying to superficial malignancy, certain gynaecological primary growths, and to mammary secondary deposits, which groups are, with few exceptions, highly favourable subjects for radiation; but to apply the term "lethal dose" to other conditions, such as gastro-intestinal carcinoma or primary breast tumours as a whole, is an unwarranted reasoning from the particular to the general. Hence the term "cancer dose" should be abolished, or only used with qualification. From the pathological side also we can learn much about the mode of spread of malignant lesions beyond their apparent limits. Stiles and Handley especially have shown this with regard to breast tumours, and how very widespread many apparently localized growths are. A case I saw a few weeks ago in the *post-mortem* room illustrated this. It was a mediastinal growth, probably an endothelioma, which had widely invaded the lungs and upper abdominal viscera. The case had only been in hospital a few days, and the day before the necropsy had been marked down for radiation treatment of the mediastinal growth. What possible chance could radiation have had with such a widespread affection? Similarly I saw a rectal carcinoma lately in which a large and, I believe, unsuspected abscess was opened in the growth, between the upper rectum and bladder. That radiotherapy is so frequently unavailing in bad cases is often due to such clinically latent causes.

This leads us on to the clinical aspect of the matter. Patients are usually referred to us after other lines of treatment have been tried ineffectually, or if for special reasons other lines are contraindicated, and naturally our percentages of success must remain low so long as this continues. And to decide whether to accede to the urgent requests of patients and relatives to try what radiation can do as a last resource, or to refuse to accept responsibility for cases in which there is not quite a reasonable probability of good resulting, is often a matter of the greatest difficulty; two equally eminent surgeons have recently expressed to me diametrically opposite opinions as to what I should do, one saying, "Only treat such cases as you are certain to cure"; the other saying, "If *you* can't do any good no one can, so why not give her a chance?" My opinion is that as there is at present practically no known alternative likely to do good in some of the bad inoperable cases which come to us, many of them should be accepted, but only on the clear understanding on the patient's or relatives' part that arrest of the progress of the disease is the most that should be hoped for, and "cure" is only the remotest possibility. The public has unfortunately been led to believe that the 80 per cent. or so of cervical cancer cures at Erlangen applies to all other cancers—a very unfortunate and much to be regretted misapprehension. The two classes which ought to be refused are, first, cachectic

patients, as Krönig pointed out; and secondly, as Seitz and Wintz point out, those in whom the disease is too widespread —as, for example, when there are malignant ovarian growths with deposits in the pelvis and throughout the abdomen, and this especially if there is also ascites. In these cases to give a full carcinoma dose throughout both pelvis and abdomen would be impossible without causing severe general damage. Treatment of a part—for example, the pelvic deposits—may perhaps be undertaken in the hope of producing an immunity to the whole condition; but, so far, I have seen no case with ascites treated in this way in which any good resulted. As to cachexia, cachexia from the malignant condition should not be confused with the ill appearance which results from a septic mouth or other removable cause. A patient should have definite blood-changes and a cachexia which does not respond to general measures before one refuses him the chance that radiation may do good, all other measures having failed. The clinical aspect is a wide one, including the question of radiation before or after operation (radiation *before* operation being largely done now in America), the general treatment advisable before and after the radiation, also the interrelations between us and most of the other branches of medicine and surgery. At present our position with regard to malignant disease is most sure when, remembering the immense variety of pathological growths, we endeavour to establish the use of radiotherapy as a valuable adjunct or alternative to surgery in various types and sites of growth; this, so far, has been done most successfully in the gynaecological sphere and in superficial malignancies, such as rodent ulcer. The future will show how far we can control leukaemias, mediastinal growths, and those in the gastro-intestinal and other systems.

Next as to technique. As regards instrumental technique, the first essential is to know one's own apparatus and what it can do, and this with standard Coolidge, or long Coolidge, or gas tube, or Lilienfeld tube. The secondary voltage must be constant, and to ensure this either the town voltage should be measured to see if it varies or not, and be corrected if it is variable (some have done this by passing the main current through a large resistance so that it may be stabilized), or else the interrupter speed should be noted, for when the main voltage goes down the motor slows and the penetration rises as Schempp has pointed out, and if this happens the scale on the switchboard showing the hardness is a much less reliable guide than the alternative spark-gap, as may easily be proved by anyone who experiments with these factors. As in some towns the primary voltage varies as much as fifty volts up or down, this is obviously a factor which requires attention. The newer Erlangen apparatus with a motor counter on the switch-table avoids this source of error.

As to clinical technique, first I should mention the preliminary ionization with copper selenate, which at Erlangen has been so heartily recommended, especially in septic cases. I cannot dispute the clinical findings as to its benefit, but the theory on which it is based, that copper particles penetrate along with the positive current to a considerable depth (sometimes given as up to 12 cm.), I take leave very much to doubt. Dr. Turrell's experiments and reasoning appear to dispose of that claim, in my opinion; he has shown that the blood and tissue fluids rapidly disperse any inflowing ions. But that the galvanic current in itself may have a powerful effect in making the malignant tissue more radio-sensitive no one can deny, and Voltz recently has discussed this effect and shown marked cellular changes in the ovaries of animals resulting merely from the passage of a galvanic current. This question undoubtedly requires much further working out, as also the other aids or alternatives to radiation treatment, such as diathermy.

Next as to the use of radiation from a great distance—up to a metre. In my opinion this should be abandoned on the score of time and unnecessary expense in staff and apparatus, and another method of improving the depth dose be substituted—namely, giving the surface an artificial depth by interposing several centimetres of wax, paraffin, water, or the like. Dessauer in recent articles has referred to this method, which I started on my own account some months ago. He quotes Chaoul of Munich and von Viesner of Vienna as having started the method, but von Viesner's article I cannot trace, and all the literature I can find of Chaoul's on the subject refers to quite another method—namely, collecting the rays that would pass beyond the sides of the body, in laterally placed paraffin blocks, thus reflecting some of the more divergent rays back on to the body, and increasing the intensity, especially at the sides of the area irradiated. This is quite a different method from the one I can recommend as the result of some months' experience, by means of which many of the distance doses recommended in the original Erlangen method can be reduced to half or less of the time necessary with the same results in the depth intensities. I was glad to hear from Dr. Casman of Antwerp, at the recent Radiological Congress, that he uses this method in breast and other cases, and is very well satisfied with the result.

As to the use of small fields, it is very difficult to orient them so as neither to have too much overlapping nor to miss out areas altogether. To avoid these technical errors, and to calculate the depth dosage as accurately as possible, I suggest that every case treated should have sectional drawings made to scale, with the ports of entry mapped in, and doses at each successive centimetre written in, and this in at least two diameters of the body or area irradiated. Holfelder has devised little gelatine shapes giving the depth doses for different fields and percentage depth doses, and these should be useful for quick calculation, as overlapping they obliterate marks on the paper below corresponding to different intensities.

The method of scaled sectional drawings in some form or other must be recommended as the only accurate one; also in radium work this should apply. Professor Lazarus-Barlow has told me that in his recent visit to America he found that this is the method adopted in each case in the radium work at most important clinical centres. Perfect accuracy is of course unobtainable; the tissues, from their varying blood and mineral content, cannot have a scattered radiation, or absorption with secondary characteristic and beta radiation, exactly as that in water. Nor can one easily calculate the depth doses when air-containing organs, like the lungs, bowels, larynx, etc., are concerned; also bones, having an absorption like aluminium, complicate the calculations of pelvic doses and those in the lungs, spine, or head. The biological factors in this way alone elude physical powers of measurement, apart from other limitations of the physical point of view. In the measurement of depth intensities, working on Voltz's or Dessauer's tables, and using a superficial layer of wax, a slide rule will be found most convenient in calculating the proportional doses to those in the tables, and in many cases to give several full skin doses converging will be found to give too much of a deep dose, and this is especially the case where thin patients are being treated. It has been indeed usually in very thin patients that bowel and other damage has been observed, and this may have been a result of a wrong routine use of the typical Erlangen technique, which applies only to stout Bavarian patients! The only way to avoid overdoses is by careful measurement in each case.

Professor Wintz and Dr. Langer have a wonderful system of radiological technique which they have evolved practically for all parts and suitable conditions of the body, and incidentally this technique (until Dr. Langer publishes his long-expected book) can only be learnt by a visit to Erlangen or by instruction from someone who has been there. I am, however, strongly against Langer's ingenious method of localizing fields—the small fields, for example, on the cervix or pylorus, or the large fields as on the chest—by screening to centre or delimit the area irradiated. When this is done with the tube running at high voltage the observer is exposed to the great amount of scattered radiation in the close proximity of the tube. Professor Russ has very kindly examined this electroscopically, and in his opinion he considers it a very dangerous method for radiologists to use. Personally I have never done it without substituting a soft tube placed with its focus at the same position in the tube box as the high-voltage tube's focal point. This exchange only occupies a few minutes, and can be recommended to all who employ the original Erlangen methods, otherwise a localizer, like Campion's localizer, can easily be constructed where accurate centring has to be carried out. With the large fields in the Warnekros-Dessauer methods, their plan of substituting for the tube a pointer which gives the area irradiated is a most valuable assistance to accurate technique without running the risk of exposure to radiation. The exposure to radiation in tube-testing or reading the small ionto-quantimeter can also be lessened in various ways—for example, by moving the Kienböck strips on to the surface of the wax while fixed in the end of a long rod, or reading the electroscope scale from a distance by mirror reflection. A small point in technique is to cover the metal filter above and

below with celluloid, as Warnekros does; this can be heartily recommended: above it prevents the tube sparking to the metal, and below it a ts as a filter for the soft rays from the copper or zinc.

I see no reason why the Erlangen wave-length should be used in all cases; in particular I am doubtful of its value in breast prophylactic work, as the damage to the blood in the lungs and heart may counterbalance the likelihood of good resulting to a possible pleural invasion. Personally at present I use a standard Coolidge run at 11½ to 12 inches spark-gap, giving a depth dose of about 12 per cent. at 10 cm. deep (5 mm. filter) for prophylactic breast cases; or use the Erlangen wave-length on to a large primary growth, and the Coolidge on to the outlying areas.

The Erlangen scheme of a six or eight weeks' interval between doses should not be taken too literally. Surely much must depend on the type and speed of development of the growth as well as on the general condition of the patient. Between the one absolutely maximum cancer dose ideal of Krönig and Warnekros, and the old method of multiple smaller doses, repeated at short intervals, which Kingery in a recent note says he has been trying to establish experimentally as the best method, those of the Erlangen school occupy a middle position: they give submaximal doses and repeat them (it must be remembered that the Erlangen "skin unit dose" is smaller than the maximal skin dose of Warnekros); it is certain that much work yet remains to be done before we can decide which method is the best, or in which cases which should be preferred. Experiments like those of Lazarus-Barlow on the rat, on columnar and squamous cells, suggest that squamous-celled types of growth would respond better to small doses frequently repeated, and columnar to maximum doses. The subject is being experimented with; radium emanation "seeds," for example, provide a ready means of trying long-continued chiefly beta radiation of small intensity, the results of which must have a bearing on *x*-ray work, and may show that the method Löwenthal and others have employed of giving *x* radiation an hour or so daily for eight or more days through a filter of a quarter of a millimetre of lead may in certain cases be the best method of *x*-ray treatment. (Christen has estimated the half value for radiation after 0.25 mm. Pb as 10 cm. in water.)

The whole subject is thus seen to be one in which as yet sure conclusions are hard to find. Certain is it that the application of deep radiation treatment is not one which can be undertaken by untrained medical men, or by nurses or laymen without the probability of grave damage being done to patients. A communication I had a few days ago from a no doubt very worthy gentleman in one of the colonies who styles himself "Consulting Radiologist" to a hospital, though he is an electrical engineer, asking for the fullest details of the instruments and technique necessary for deep therapy, and for the results which are being attained, seems to me rather ominous. Before a German medico-legal congress last year I heard Professor Wintz in an address very strongly emphasize this danger, that the apparatus may come into the hands of those who are not properly qualified to use it. However, there are dangers in the use of every potent remedy as in the use of most modern inventions, and it is easier to point to possible abuses than to suggest a remedy.

The main fact is that we are now witnessing a series of notable advances in *x* ray instrumentation, and in methods of quantitative measurement of depth radiation, and these must in a short time result in a greatly increased knowledge of the subject. As to results, I am quite satisfied that some of the beneficial effects I have already seen could not have been obtained with any other method of treatment, and if the already published results receive confirmation as time goes on we shall undoubtedly have achieved a very important stage forward in the conquest of malignant disease.

III.—F. HERNAMAN-JOHNSON, M.D.ABERD.,

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I PROPOSE to confine my remarks to the statement of certain fundamental principles—or, at least, what I believe to be such. Some of these, while they were more or less accepted a few years ago, appear to be in need of reassertion.

A cancer cannot be clinically considered apart from the tissues amongst which it grows, or from the patient as a whole. This means that the effect of any given dose of *x* rays upon a cancerous tumour is composed of (1) the direct effect upon the malignant cells; (2) the reaction of the normal surrounding tissues; (3) the general constitutional response.

Now, the effect upon the tumour varies not only with its histological structure and with its position in the body, but also with the particular moment at which it is attacked. In thinking of tumours we should try to substitute in our minds a dynamic for a static conception. You have all seen by the aid of the cinematograph a plant growing from seed to flower in a few moments. Imagine this process applied to histologically similar tumours, and suppose it to display differences in mitotic activity, as well as in general growth. We should then see that no two were alike—and even then this unlikeness would not be fully made manifest, for those subtle divergences covered by the word "metabolic" cannot be made visible, even with the microscope.

I come next to the surroundings of a cancerous growth. That they play an important part in its disappearance under radiation cannot be doubted. A rodent ulcer—which is really an ulcerated tumour—is a truly malignant condition, although it does not tend to form metastasis. So long as it invades only the soft parts, it may usually be made to disappear by almost any method which stimulates the tissues round about it. Some years ago I tried to see how minute doses of *x* rays would affect rodent ulcers, and found that, as long as any action at all could be observed, it was a favourable one. But once let the rodent invade cartilage or bone and nothing save excision or diathermy is of avail. Yet the tumour has not changed, but only its habitat.

Finally, there is the patient to consider. It has long been observed that an anaemic patient will not respond well to *x* rays; and the rapid spread of metastatic growths after a serious attack of influenza is a well-known phenomenon. The slowness of most forms of cancer in old age has long been remarked on. On the other hand, the part played by worry in lowering resistance to malignant disease cannot be disputed.

If it be granted that the effect of an *x*-ray exposure is indeed determined by factors so numerous and so variable, it becomes difficult—for some of us, impossible—to accept the doctrine of the single lethal dose. I question if, in point of fact, this doctrine is still held by those who only a year ago advocated it so strenuously in the medical press, and not in that press alone. One hears of precautionary doses after six weeks, and of yet further "precautions" at later dates. But if repetitions every six weeks, why not every six days? Once give up the idea of the "knock-out blow," and the precise size and spacing of divided doses offers wide and legitimate scope for individual preferences.

It used to be accepted as axiomatic that cancer cells—apart from certain very resistant types—were depressed by *x* rays more than their surrounding healthy neighbours, and that in some cases a dosage detrimental to malignant cells might actually stimulate normal ones. If this is true—and for my own part I do not doubt it—it follows that a cumulative effect may be obtained by repeated dosage.

The doctrine of the "small stimulating doses"—that is, stimulating to cancer cells—has, in my opinion, done an immensity of harm. It has frightened men in small hospitals possessing only 12-inch coil outfits from treating breast cases, in the belief that they would do harm. Now, there is no radiologist of experience who does not know that we were often able to keep breast cases in comfort for years, long before the high-voltage outfits, or even Coolidge tubes, were ever heard of. Most of us have seen pain disappear and palpable growths melt away under what would now be called primitive methods. On the other hand, I cannot recall any instance in which such treatment appeared to make patients worse, even when it did no apparent good.

For the past year I have had in my private practice apparatus for the excitation of a new model Coolidge tube in oil at a potential of 230,000 volts; and I have applied it to many cases of inoperable or recurrent breast cancer. During the same period I have treated an approximately equal number of similar cases at the French Hospital—in the latter case being limited to a voltage of about 160,000.

I cannot honestly say that the extra seventy kilovolts appears to improve results. The twenty cases of breast carcinoma which I have had under observation for purposes of this test are all still alive and doing well after periods varying from a year's to two months' treatment; and I have patients treated under the old methods still going about their affairs five years after the original recurrence.

I hasten to say that I have not tried my high-voltage apparatus on any carcinoma mammae case by the method of

the single massive dose. It is generally agreed that the procedure seriously affects the blood of the patient and lowers the resistance for some weeks to metastatic invasion. On the other hand the graded dosage system causes the patient to improve in every respect almost from the start, and without any intermediate period of depression.

The recurrent or inoperable breast case properly treated by graded dosage does not ultimately die from visible or palpable local tumour, but from metastatic invasion of lungs, liver, spine, or ovaries. Can massive doses applied to the original growth prevent this termination? I do not think it will be claimed that they can. On the other hand they may hasten it. But the graded dosage actually raises general body resistance to cancer, and therefore, for a time at least, prevents its generalization.

The last thing I want to suggest is that the *x*-ray treatment of breast cases should be undertaken by amateurs, or that research should not be vigorously prosecuted by the newer methods. But when a man has been getting good results for years with an ordinary outfit in a hospital which is unable to afford a high-voltage apparatus, he should not be frightened into giving up because of the doctrine of the stimulating dose. There never was a more unsubstantial bogy raised in medicine, yet it has in all probability deprived many unfortunate people of the mitigation of their sufferings offered by *x*-ray treatment as it has been carried out in this country for the past dozen years.

When I come to speak of uterine cancer I am on ground less firm. In my hands the older methods have often given considerable relief, but I have generally regarded such patients—always, of course, either inoperable or recurrent—as having not more than a few months of active life before them. There would appear to be hope that by the newer methods this expectation of life will be increased.

The early, still operable, case of carcinoma of the cervix is the one most suited for Erlangen methods, and is the type on which their reputation is really based. That this form of cancer may be made to disappear by massive doses, and that the patient may be given a further lease of life, is beyond question. This may also be accomplished by surgery—whose record is not, however, at all brilliant in this respect. The ultimate results of intensive *x*-ray therapy may be far from good and yet be superior to those of surgery. It is a matter of statistics. If a man has an operable carcinoma of the bowel my advice to him would be, "Have it cut out." If he has a sarcoma almost anywhere I should say, "Do not let the surgeon near it, unless, perhaps, to put in a radium tube." But if a woman came to me with early carcinoma of the cervix and asked my advice as to whether she should have an operation or treatment on the lines recommended by Professor Wintz I could not, at the present moment, give any decided opinion.

Finally, I wish to say that if I am not as impressed as some are with the results of Erlangen treatment it is not because I doubt that many of these results are excellent, and, in some cases unique, but because I am familiar with the extraordinary benefits, amounting not seldom to clinical cures, which methods long in use in this country have to their credit. I welcome the high-voltage outfit as a great advance in instrumentation, and the work now being done at Erlangen in the way of preparing the patient and sensitizing the tumour by electrical methods previous to its exposure to *x* rays seems to me to promise much. It proceeds along the threefold line of attack which was referred to at the beginning of my remarks. In the case of a protean malady like cancer combined treatment in the widest sense can alone hope to succeed.

DISCUSSION.

Dr. W. MITCHELL (Bradford) said that he shared to a large extent Dr. Hernaman-Johnson's scepticism with regard to the stimulating dose. He had administered about 9,000 treatments a year with the older type of apparatus, and had not seen any stimulation produced, but rather the reverse. Sometimes he had observed a rapid metastasis follow surgical treatment. He had known cancers of the breast to lie quiescent for many years, and then, a very few weeks after operation, rapid metastasis occurred—whether due to mechanical injury or to a depressing effect on the body tissues he could not say. If radiologists were accused of stimulating cancer by their methods, then surely surgeons might be accused of doing the same kind of thing. As for Erlangen methods, an apparatus for deep treatment had been installed at his institution, and he had treated about one hundred cases, post-operative, recurrent, and non-operative. In passing he would recommend that before a case was undertaken a skiagraphic examination of the lungs should be made, and if the lungs were affected the case should be left alone. The speaker then gave particulars of some of his cases. Those which were handed to him were mostly surgical derelicts—cases which were absolutely hopeless from the beginning; it was clearly impossible properly to estimate the success of Erlangen methods until surgeons handed over their cases much sooner. It was useless to try to treat cases in which the pelvic viscera were largely involved or the vagina stopped up with a large tumour. He had had recurrent cases in the early stages when there had been nodules of the size of walnuts in the vagina, and in which good results had been obtained. He had also had four or five cases of carcinoma of the vaginal walls, one patient being a woman of 60, who was now quite well. In one case of carcinoma of the stomach, where the patient had died, the *post-mortem* examination had revealed extensive disease, not alone of the stomach, but of the duodenum, the liver, and the pancreas, with carcinomatous invasion of the peritoneum, so that there was not much chance in that case. He was satisfied that the method had a useful future, but it required a very large amount of time if the work was to be done thoroughly.

Dr. WOODBURN MORISON (Manchester) agreed with Dr. Hernaman-Johnson in his remarks about stimulating doses. He had never seen any cancer stimulated by the ordinary dosage such as the radiologist had been using for years past—a full pastille dose through a filter. He had been interested in the treatment of rodent ulcer by radium; at the present time, in Manchester, the tendency was to use unscreened radium in these cases. He believed that the direction of development for radiation treatment in the future would be in the selection of the wave-length for different tumours and for different parts of the body.

Dr. GIBSON GRAHAM (Glasgow) said that his experience was that *x* rays in too small doses would stimulate growth on the extending part of an ulcer.

Dr. A. R. HALLAM (Sheffield) confirmed Dr. Graham's view, as the result of many years' experience of rodent ulcers. He had seen people who had had a rodent ulcer for years, which made practically no progress, and then, after one or two small *x* ray exposures, it disappeared for a short time, only to show later a rapid increase of growth.

Dr. HERNAMAN-JOHNSON said that although it might be argued theoretically that radiological treatment could stimulate cancer growth, yet in clinical practice the treatment was not found to have that effect.

DISCUSSION ON THE VALUE OF GAS INFLATION IN X-RAY DIAGNOSIS.

OPENING PAPER.

BY

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[WITH SPECIAL PLATE.]

Historical.

THE idea of obtaining contrast by the injection of air is, of course, as old as radiography itself. The first man who looked at a normal chest and saw the heart standing out clearly against the almost transparent lungs must surely have been struck by the beauty and clearness of the picture; and when he proceeded to screen the abdomen could scarcely fail to wish that nature had there provided equal facilities for the elucidation of disease.

No very long time elapsed before, as a matter of chance, radiographs were obtained in which either the lower border of the liver, or the spleen, or both, were outlined with considerable clearness by collections of gas in suitable parts of the alimentary tract. This observation was followed by deliberate attempts to throw light upon abdominal problems by the artificial inflation of the stomach, colon, and bladder. In a work entitled *The Röntgen Rays in Medicine and Surgery*,

written by Williams of Boston, and published no less than twenty-one years ago, are to be found descriptions of such procedures, and also of the bismuth meal and the bismuth enema. The "normal stomach" as described in *x*-ray text-books of the present day was figured by Williams in 1899, and to him rather than to later German workers should go the credit of originating the opaque-meal idea. In fact, there are very few modern developments, whether of instrumentation or of diagnostic technique, that are not foreshadowed in this book; but I regret to say that I have been unable to find in it the germ of the idea of the deliberate inflation of cavities other than those of the hollow viscera.

The injection of gas into the pleural cavity for therapeutic purposes and the control of the procedure by fluoroscopy were well established early in the first decade of this century; but the idea of inflating the peritoneum for diagnostic purposes would really appear to have originated in Germany within the past ten years. Weber, in 1913, appears to have been the first to do so with the deliberate intention of improving radiographic contrast; and Goetze published the first extensive report on the subject, together with some plates and diagrams. From Germany the method spread to America, and so far as I am aware the first published cases in England were done at St. Bartholomew's Hospital less than two years ago.

In addition to the distension of the hollow viscera, gas inflation for diagnostic purposes is now employed in the peritoneum, in the perirenal space, in the joints, and occasionally in the ventricles of the brain. All of these procedures are germane to the present discussion, but I have not personally sufficient experience of the method as applied to the joints or to the brain to say anything useful; and upon the inflation of hollow viscera I intend to touch only briefly.

Inflation of Hollow Viscera combined with Pneumoperitoneum.

Inflation of the stomach with some effervescing powder is a well-known proceeding, to which the objection is often raised that, the amount of distension not being under control, there may be some risk of rupturing an ulcer, should such be present. Recently, in conjunction with Dr. Ernest Young, I have made some experiments upon inflating the stomach and duodenum through a fine duodenal tube, which Dr. Young has kindly passed for me. So far as the duodenum is concerned, the gas appears to distribute itself too quickly into the small intestine to permit of useful outlining. It may be possible to devise some pneumatic form of blockage; but, meanwhile, the method furnishes a safe way of inflating the stomach under direct fluoroscopic control. Incidentally, it has been shown that the metallic head of the tube may be in the duodenum a very considerable time before an alkaline reaction is obtained from the fluid syphoned up.

The value of stomach inflation would appear to me to lie in this: that, when combined with peritoneal inflation, it may enable us to recognize comparatively small changes in thickness in the anterior wall of the stomach. Those who have studied lateral radiographs taken after peritoneal inflation will realize that extremely small differences in density can thus be demonstrated.

Uses of Peritoneal Inflation.

Coming now to the uses of peritoneal inflation, one has to ask oneself, What lesions can be demonstrated by this procedure which cannot be diagnosed by other means? A study of Fig. 1 (see Special Plate), which is a composite radiograph of the whole peritoneal cavity in profile, will help us to answer this question in part. Starting from the diaphragm, you see the liver clearly in profile; and irregularity of size or shape would be at once apparent. It is true that we see the viscus in one plane only, but we may, if we wish, take other plates with the patient rotated through various angles, and we can also get the lower border of the organ outlined in the postero-anterior view. A liver which will pass these tests is presumably free from deforming lesions, though we cannot say absolutely that it is in no way diseased. The air space between the intestine and the abdominal wall is here free from abnormalities with one exception. That is a thin shadow band which crosses the space some two inches below the umbilicus. This was diagnosed as an adhesion between the intestines and the abdominal wall.

The patient had had a pan-hysterectomy done ten years previously, and since then had suffered a great deal from abdominal pain. Below and to the left of the umbilicus was to be felt a "lump," which was tender to touch, and which the patient said was growing larger. The "lump" was examined clinically by a well-known surgeon, who confessed himself unable to give a definite opinion as to its nature. With his approval, a peritoneal inflation was carried out, with the result I show you. This enabled one to say that the swelling in the left abdomen was not caused by the presence of a tumour. An operation was performed at which I attended. Adhesions were present to an unusual extent, so much so that the surgeon occupied nearly two hours in dissection. The patient made an uninterrupted recovery, and it may interest the Section to know that application of hard rays to the abdomen were given during convalescence with a view to preventing the re-formation of adhesions. Up to date (four months) the patient remains free from pain, and her "lump" has not returned. No doubt it was caused by a more or less permanent collection of gas, the result of adhesions.

By way of comparison, I show you a slide (Fig. 2) which represents a perfectly normal lower abdomen seen in profile. You will note the entire absence of any shadows across the air space.

The next slide (Fig. 3) I am able to show you through the courtesy of Dr. Finzi. It represents an abdominal tumour seen in profile. An obvious criticism is that in all probability the diagnosis could in this case have been made by other means. Perhaps this is so, but the size and relationships of the tumour as shown in this and other views could not in any other way have been ascertained with the same exactitude. Also, it is necessary to learn the alphabet of a new subject, and a radiograph such as this, in which the appearances are perfectly definite, is of great value to the student. For it must be obvious to anyone who considers the matter that a tumour of the same nature, but only a quarter or even one-eighth as large, would have been just as easily demonstrated. Or, to put it another way, if this patient had been examined by pneumoperitoneum when a tumour was only suspected clinically, proof of its existence would have been furnished.

Another field of usefulness for peritoneal inflation is in the diagnosis of gynaecological conditions. The method will enable a diagnosis to be made while the case is still clinically doubtful. In this country we are as yet only feeling our way as regards these inflation methods, but Dr. Carelli, at his demonstration before the Royal Society of Medicine last autumn,[1] showed us several plates in which the diagnosis of lesions in the ovaries, Fallopian tubes, or uterus was actually made by him at a time when it was impossible to arrive at any certainty by other methods. In one particular case a two months' pregnancy was demonstrated by reason of the characteristic type of enlargement of the uterus; this is surely a great triumph of radiological technique.

To sum up, comparatively small deviations from the normal in the size, shape, or relations of the viscera within the peritoneal cavity can be demonstrated by the inflation method. Adhesions are made visible, and solid tumours at an early stage of their growth can be clearly seen. There is also some hope that improved technique may enable one to detect cancerous infiltrations of the walls of the alimentary tract.

Risks.

It can scarcely be denied that the procedure of peritoneal inflation represents a startling advance in diagnostic technique, with which the introduction of the opaque-meal method is alone comparable in individual importance. Yet there is, unfortunately, a pronounced difference in the two cases. The opaque meal and enema are free from risk, or nearly so. Peritoneal inflation is not free from risk. Dr. Carelli informed us that he had done over 700 cases, with only one (non-fatal) mishap. But others have not been so fortunate. James T. Case, in a recent review of the subject, has collected records of four deaths. Of these, one was due to the introduction of oxygen into the spleen; one to peritonitis; and in the other two the patients became cyanotic, and collapsed a few seconds after the introduction of the needle, and before any appreciable amount of gas had entered the peritoneum. In neither instance was necropsy permitted.

Case offers no definite opinion as to the cause of death in these patients. Choyce[2] states that in a certain small percentage of people the diaphragm is perforate in places, so that there is communication between the abdominal and thoracic cavities. Under such circumstances, pneumothorax would result with possible embarrassment of the heart. If such a condition could be demonstrated fluoroscopically one might be called upon to introduce a trocar into the pleural cavity and aspirate the gas. But while this is a possible

[1] BRITISH MEDICAL JOURNAL, December 17th, 1921, p. 1037.
[2] Private communication to author.

explanation of the fatalities which Case records, it does not seem to me probable, as the cyanosis occurred almost immediately. Personally I should be inclined to class these with the recorded instances of death following simple paracentesis of the pleural cavity. The nearest we can get to an explanation is to say that the slight trauma to the sensitive pleura or peritoneum is sufficient to produce reflexly cardiac disturbances, which may be so severe as to prove fatal.

The important point to bear in mind is that there is no known way of avoiding such accidents.* They are fortunately extremely rare, but must nevertheless be reckoned with.

Importance of Careful Technique.

Apart from the above, safety may be secured by careful technique. The use of a fine needle is most desirable. I prefer to make my puncture through the belly of one of the recti muscles, about two inches below the level of the umbilicus. One can soon learn to feel when the needle passes through the posterior sheath. The open end of the needle should then be watched to see if any blood comes out. If so the needle should be reinserted, otherwise one may inject gas into a vein. Gas should then be introduced slowly from a suitable apparatus (Fig. A). If the needle is still in the muscle, pain will be produced at once.

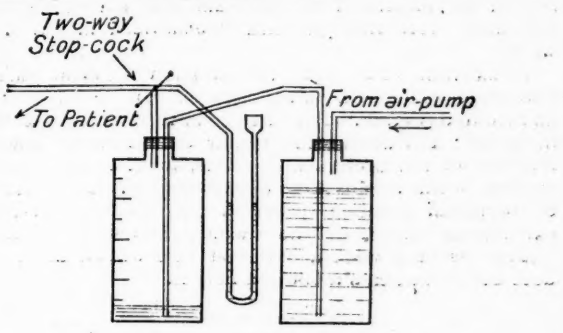

FIG. A.—Diagram of inflation apparatus.

If, however, the point has pierced the abdominal wall it must be in either (1) the peritoneal cavity, (2) some solid organ which is enlarged or mal-placed, (3) the substance of an abnormal growth, or (4) the lumen of the bowel. Of these the last-mentioned contingency can happen—apart from gross carelessness—only if the intestinal wall is glued to the abdominal parietes by adhesions at the site of the puncture. In one of my early cases, as I did not recognize by the screen what was happening, I interpreted the folds of the bowel as adhesion shadows. The patient passed most of the gas per rectum within a few moments, and was none the worse. Subsequent operation showed the intestine to be, as it were, plastered on to the anterior wall of the abdomen, and it would probably have been impossible to obtain a proper pneumoperitoneum. Puncture of the bowel wall under such circumstances is harmless as regards risk of infection of the peritoneum, as the puncture, even if it remained patent, which it does not, is innocent of any communication with the body cavity.

Puncture of an hypertrophied spleen, or of a large tumour, is not likely to happen if the inflation has been preceded, as it always should be, by careful clinical investigation and radiographic examination along ordinary lines.

Having made sure that the gas is really passing into the peritoneal space, one may proceed to inject slowly and continuously, checking the process from time to time by screening. The amount to be introduced varies according to several factors, but, generally speaking, about three litres is sufficient in an adult of average size. When there has been previous ascites as much as ten litres has been tolerated without discomfort. On the other hand, if there is pain or distress, no attempt should be made to reach any special academic limit. If pain is complained of between the shoulders, Carelli's recommendation to tilt the patient upwards from the feet will be found useful.

There are many other details of technique which should be mentioned, but time does not permit of their consideration.

Two further dangers other than those previously mentioned must be briefly touched upon. The first is the risk of causing peritonitis. This can be minimized only by the most careful attention to asepsis. The second is the possibility of causing damage by the mechanical effects of intraperitoneal distension. It is quite obvious that protective adhesions may be broken down, and that in some instances virulent septic organisms, previously walled in, might be let loose to play havoc in the peritoneum at large.

The immediate after-care of the patient is of great importance. If CO_2 be used there is no need to deflate, as all feelings of distension will have passed off in from one to two hours. It is, however, in my opinion, essential that the patient should remain in the horizontal position for several hours, preferably for a complete day. This means that the examination should be carried out upon a wooden stretcher which fits the *x*-ray couch top, and which enables the patient to be carried back to bed without disturbance. If such cases are examined in private consulting rooms they should be sent at once to a nursing home in an ambulance. They are, in a sense, surgical risks, and must be treated with due respect.

I have no sympathy with the cry that only a professional surgeon should do the inflation. If the radiologist cannot do it, he has no business to have a medical qualification. But I do not think that the radiologist alone should ever decide that the procedure is necessary. Another medical man should always be associated with him, and they should make quite sure (1) that a satisfactory diagnosis cannot be made without pneumoperitoneum, and (2), in cases where an operation would appear to be a necessity in any event, that the inflation is likely to furnish the surgeon with advance information of sufficient value to justify the slight but undoubted risk involved in the procedure.

If the radiologist honestly fulfils these conditions precedent and keeps his patient under observation for at least forty-eight hours in such surroundings that a laparotomy can, if necessary, be performed at short notice, he can face risks with as clear a conscience as that of the neurologist or pathologist who carries out spinal puncture after being duly convinced of its necessity.

Perirenal Inflation.

I propose to devote the remaining few minutes to some remarks on the method of perirenal inflation introduced by Dr. Carelli of Buenos Aires. You will perhaps remember that Dr. Carelli gave the first demonstration in this country in my department at the French Hospital in London in November of last year. A detailed account of his procedure, as it appeared to me, was published, together with reproductions of some of the radiographs obtained, in the BRITISH MEDICAL JOURNAL for January 21st, 1922. I cannot here repeat the substance of this paper, but will confine myself to summarizing the results of my personal experience with perirenal inflation since that time.

To begin with, it should be clearly understood that the technique is not easy. I have myself gone into the colon by mischance, and on the Continent I understand that the pleural cavity has been entered on more than one occasion. Such accidents are the results of inexperience. Dr. Carelli recommends that the needle should be directed vertically downwards so as to touch the tip of the second lumbar transverse process, then turned somewhat upwards and outwards so as to slide past the end of the bone. It is difficult to gauge the correct angle, and I now prefer to start half a centimetre beyond the tip of the process, and to direct the needle point slightly inwards so as to touch it. The object of this is to secure a landmark, especially as to depth. Having obtained my bearings, I then cause the needle to resume the vertical position and push it in another centimetre. A very usual mistake is to insert the needle too deeply before making test injections. (For rough sketch of relations see Fig. B.)

One should now watch to see that no blood wells out of the socket of the needle. An ordinary record serum syringe previously filled with gas is then fitted into the needle socket. The joint must be airtight. Quick pressure is made on the piston, and one of three things happens: (1) An elastic resistance may be developed. This means blockage of the

* Since the above address was delivered I have been concerned very much with this question of possible peritoneal shock, and have adopted the following modifications of technique: (1) Following the teachings of Crile, I now use a local anaesthetic, not primarily for the purpose of making the procedure less painful for the patient, but so that the parietal peritoneum may be desensitized before the needle passes through it. To secure this, eucaine is injected slowly as the needle is introduced millimetre by millimetre. The extra time involved is seven or eight minutes. The same needle is used throughout, as its socket fits the standard record syringe. (2) While previously I had contented myself with warming the gas in a rubber bag before charging the apparatus, I now pass it through a coil of metal tubing which fits into an ordinary thermos flask containing boiling water. The gas really is warmed to body heat by this method, and there are no complications in the way of electric-heating filaments. By this twofold precaution—anaesthetization before puncture and the introduction of gas at approximately blood heat—one hopes to reduce the risk of peritoneal shock to a point when it need not be seriously considered.

needle, and a fine obturator, definitely longer than the needle, must be passed down it. This generally suffices, but sometimes it is necessary to inject a few drops of sterile saline solution. (2) The gas goes in easily, but produces a sharp pain. This means muscular distension, and is an indication for pushing the needle in a little more deeply. (3) The gas goes in easily, and no pain is produced. This is as near an indication as we can get that the perirenal space is reached.

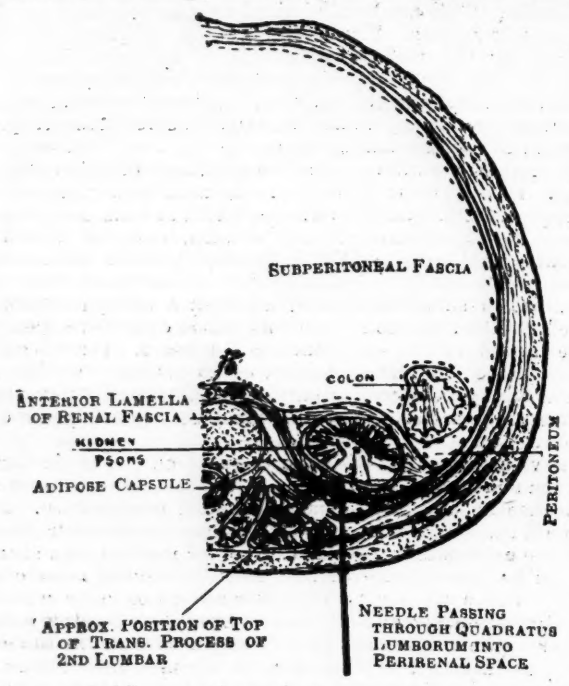

FIG. B.—Transverse section of body through kidney region, showing needle in position for perirenal inflation (modified from Gray).

We now connect to the main apparatus, and introduce about 50 c.cm. of gas. Then, using the two-way stopcock, test the manometer readings. The column should show increased pressure at inspiration; if by any chance one is in the pleural cavity pressure is diminished when the patient draws in his breath. In my experience manometer readings are not obtained until a certain amount of gas has been injected, although I understood Carelli to say that often the fluid column moved as soon as the needle entered the perirenal space.

It is necessary to inject at least 500 c.cm. of gas—a little more will enhance the contrast obtained. There should be practically no sensation at first, but subsequently a feeling described variously as "pressure," "distension," or "dull aching" is complained of. This is not of sufficient intensity seriously to inconvenience the patient. After about half the proposed quantity has been injected, the process should be checked by screening. It must be remembered that a considerable length of needle is sticking out, which must not be knocked in the dark. A simple device like a miniature table, which straddles the patient, its legs resting on the couch on either side, is used to avoid accidents (Fig. C). This is put in place before the lights are turned off and the screen is rested on it. One can then examine freely, and it is generally possible to decide whether the gas is correctly outlining the kidney. If so, the remaining amount is injected, the needle is removed, and plates are made in the ordinary way. These should be taken both from below upwards and from above downwards, the reason being that the views are by no means identical, and that points missed in the one position may show in the other. I show you now (Fig. 4) a case which Mr. Mortimer Woolf kindly asked me to examine for him. Here, besides the large obvious calculus, a cluster of small stones is visible. In this plate only three separate small shadows are seen; but in the next (Fig. 5) four small shadows are seen. Obviously there are cases in which exact knowledge as to the number of small stones present in clusters may be of great surgical importance.

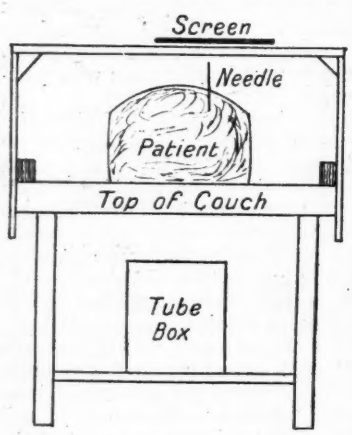

FIG. C.—End-on view of couch with screen on supporting table.

There is just one other point of technique which I have found useful, and which I will briefly describe. In fat people, and in cases with lateral curvature, it is necessary to know in advance the exact position of the second lumbar. This is best ascertained by fixing on to the patient's back a half-plate-sized film in a tight-fitting black envelope. It can be stuck on by pieces of strapping, and its outline marked in ink on the skin. An exposure is then made, the film is developed, fixed, and dried in spirit. A needle is stuck through the image of the transverse process, so that the point just protrudes, and the film is replaced on the patient so as to coincide with the original marks. The skin is then pricked slightly with the needle and the film removed. If now iodine is rubbed on the skin over the needle prick, the latter shows as a permanent dark speck, which forms a valuable landmark. Apart from this special technique, no case should be examined by perirenal inflation which has not previously been radiographically examined in the ordinary way.

The advantage of being able to show the complete kidney outline, together with that of the suprarenal capsule, need not be laboured (Fig. 6). It will often in itself clear up a doubtful diagnosis; and when combined, as Carelli suggests, with gas inflation of the ureters and pelvis, must leave little to be desired in the way of *x*-ray demonstration. The after-effects of perirenal inflation, provided CO_2 be used, are, in my experience, slight, and no harm appears to result from letting patients walk about soon afterwards, although one does not permit this if one can help it.

DISCUSSION.

Mr. J. MAGNUS REDDING (Guy's Hospital) said that several factors had to be taken into account in assessing the value of any method of diagnosis: (1) the safety and ease of the procedure; (2) the scope of usefulness of the method; (3) the degree of accuracy in diagnosis; and (4) the value of the method compared with other methods of investigation. It was established beyond doubt that the presence of oxygen in the peritoneal cavity in large quantities was unaccompanied by any grave ill effects. The apparatus used in his own procedure of inflation consisted of two parts which, with the object of maintaining a strictly aseptic technique, were kept quite separate until the time for inflation had arrived: (1) A cylinder of oxygen with a long rubber tube, a considerable length of which was coiled into a large glass jar filled with very hot water. (2) A filter—a glass tube with a bottle neck at each end, tightly packed with cotton-wool; a short length of rubber tubing, one end of which was subsequently fitted on to the filter, the other end being provided with a hollow metal spigot; and a spinal anaesthesia needle, into the base of which the spigot fitted: these three pieces of apparatus were sterilized by dry heat. The skin of the abdomen was painted with iodine over a fairly wide area around the umbilicus, and sterilized towels were arranged around the site selected for puncture. Unless there were contraindications, puncture was made through the rectus, about one inch below the umbilicus and one inch to one or other side of the midline. The track proposed for the puncture was infiltrated with a local anaesthetic, and after a short period had been allowed for this to become effective the spinal needle was thrust slowly straight downwards. It was important to feel the very considerable resistance which was imposed by the sheaths of the rectus. The sheaths of the rectus were pierced by slow, steady pressure, and immediately after the posterior sheath had been punctured a very slight resistance was felt, accompanied possibly by a transient sensation of pain. Oxygen was then slowly turned on. He made no attempt whatever to measure the quantity of gas introduced, but he continued inflation until the patient complained of slight discomfort, upon which he withdrew the needle. He adopted this procedure because he thought the more gas the better, and the quantity was necessarily limited by the patient's tolerance. After the needle was withdrawn the puncture was sealed with gauze and collodion, and the patient turned

on to the abdomen. He had not found it necessary to wait before proceeding with radioscopic examination. Preliminary radioscopy was employed to make sure that the structures which it was desired to investigate were well enveloped in gas. The prone position was advisable as a preliminary, and this was afterwards modified to allow the best possible envelope of gas to surround the different structures. Radiograms were always taken, and ultimate diagnosis rested chiefly on these. The positions generally used were:—Liver and spleen: shoulder somewhat raised; prone. Kidneys: lateral antero-posterior views. Pelvic organs: prone; pelvis raised; also lateral antero-posterior views with pelvis raised. Double-screen films with short exposures were advisable, and the breath should be held during exposure. He attempted the withdrawal of gas only when the patient was complaining of some discomfort, for in his experience it was impossible to withdraw anything like all the gas through the needle within a reasonable space of time. The patient was invariably sent back to bed, with instructions that he might sit up when he felt inclined. The gas was usually absorbed within forty-eight hours or rather more, and appeared to be absorbed more quickly by children. He was convinced that when oxygen was used for injection patients should not be dealt with as out-patients. The effect on the patient was often painful and sometimes distressing. Pain was very much greater on movement, and especially on elevation of the shoulder, owing to traction on hepatic and other ligaments. Movements should therefore be restricted to the minimum. The pain and discomfort only lasted an hour or so if the patient remained recumbent, and there were as a rule no other ill effects. Unavoidable mishaps included puncture of structures adherent to parietal peritoneum where needle was inserted. No modification of apparatus could possibly eliminate the risk of entering the gut in these cases of adhesion. The actual danger appeared to be slight, but the results were exceedingly uncomfortable for the patient, and might be alarming. Altogether, to sum up with regard to safety and ease of procedure, there must be preparation and aseptic technique as for abdominal section; the actual inflation was exceedingly easy; the procedure was often very unpleasant for the patient, and not free from rather remote risks of very considerable pain and distress. Any undesirable effects appeared to be usually quite transient. Several deaths had, however, been reported.

With regard to the scope and limitations of the procedure, the speaker said that children usually bore it better than adults. Debility and cachexia, unless extreme, did not form a contraindication, but all inflammation of the peritoneum which showed any sort of activity, whether recent or not, should be approached with caution, and recent lesions of the peritoneum, whether primarily acute or subacute, were an absolute contraindication, owing to the possibility of separating recent adhesions or of generalizing a local infection. All conditions associated with alteration in size, shape, or contour of the liver, spleen, kidneys, uterus, and ovaries were suitable. The method was useful for abdominal tumours, other than those of the alimentary tract, the latter being demonstrated better by the opaque meal and enema. A certain number of gall stones which could not be shown on ordinary examination were demonstrable by pneumoperitoneum, but he had not met with much success in this direction. With regard to urinary calculi, the percentage of cases in which these could not be shown by ordinary examination with proper technique was exceedingly small. The degree of accuracy in diagnosis attainable by this method varied with the type of lesion. He had had most success in deciding as to the presence or absence of adhesions and the relations of tumours to the solid viscera. The nature of the tumours had eluded him. There was every reason, however, to think that with wider experience it should be possible to make a much larger percentage of absolutely definite diagnoses.

Finally, he spoke of the value of this method as compared with others. For pneumoperitoneum radiography to attain a high place in the regard of the profession, it must be insisted that only carefully selected cases be submitted to this procedure, and that the process of selection should involve thorough clinical examination, with any special examination which might be indicated. He deprecated inflation as a routine method for every subject with symptoms which might (or might not) have their origin in the abdomen. In carefully selected cases the method would very frequently furnish information which could not be obtained by any means short of exploratory laparotomy.

Dr. WOODBURN MORISON (Manchester) agreed that the operation of gas inflation was a definite surgical process; if that were generally accepted, then it was a surgeon's work. A medical man with surgical qualifications, of course, could practise as he chose, but in Manchester it was not desired that the surgeons should invade the sphere of the radiologists. In that city they had done about one hundred such operations; he had never been able to show gall stones by the method unless they had been previously demonstrated with the ordinary plate, and he agreed with Dr. Hernaman-Johnson that if the stones were of sufficient density to give a good picture they could be shown by the ordinary plate examination.

The PRESIDENT said that this was one of the newer methods in *x*-ray practice, and the Section was under an obligation to Dr. Hernaman-Johnson and Dr. Redding for their valuable contributions. They were pioneers in a new method, which, like every new method, was open to exaggeration and abuse. What he himself wished to know was why the presence of air made a part peculiarly transparent to the rays.

Dr. HERNAMAN-JOHNSON, in reply, said that the operation itself, if skilfully done, hurt the patient no more than the anaesthetizing of the track of the needle would do. In his opinion CO_2 was much more desirable than oxygen, but with CO_2, as the distension disappeared in about three-quarters of an hour, it was necessary to be fairly speedy in making the exposure; that was the only disadvantage of this gas as compared with oxygen. To relieve the discomfort after operation he had found one-sixth of a grain of morphine very useful. It was advisable to keep the patient supine for some time. Puncturing of the spleen should not take place if care were exercised. He agreed that the method often failed in the diagnosis of gall-bladder calculus. With regard to a point as to technique raised by Dr. Morison, those who had been general practitioners could not realize, and probably never would realize, why they should not use needles in the same way as they had been accustomed to use them in general practice. Possibly a new generation of radiologists, who had been brought up, after graduation, to *x*-ray work alone, might find a difficulty. Too narrow a specialism was to be deprecated. Surgeons quite rightly made use of *x* rays and electricity when they considered it advantageous to their practices, and a similar liberty should be given to other experts. One thing at least was certain: had Dr. Morison's views met with general acceptance in the past there would be no discussion on peritoneal inflation to-day, as the method had been initiated by radiologists, just as diathermic surgery owed its beginnings to electro-therapeutists. With regard to the usefulness of injected gas in showing up organs, it acted chiefly by pushing the parts away from each other, but there might also be some refractive effect as yet not fully understood.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

THE DIMPLE ON THE CONDYLE OF THE FEMUR.

THERE is a little dimple or depression, situated just above the popliteal groove on the outer condyles of the great majority of femora. This dimple is entirely ignored by most text-books of anatomy, and in the few instances in which it is alluded to it is said to be caused by the pressure of a sesamoid bone which is sometimes present in the outer head of the gastrocnemius.

A short time ago, while acting as demonstrator in the Anatomy Department of Glasgow University, I investigated this matter, with the help of Dr. D. M. Blair, the senior demonstrator. We examined between us a dozen lower limbs; we found that no sesamoid bone was present in seven out of the twelve specimens; but in spite of this fact the suprapopliteal depression was well marked in each case. In the remaining five specimens a sesamoid bone or cartilage was found; but in no case did it correspond in position to the depression, being always at least half an inch below and lateral to it.

Some other explanation will therefore have to be found for the existence of this peculiar dimple. So far as we could see, it had absolutely no *raison d'être*—nothing originated from it, nothing occupied it.

London Hospital. W. KERR CONNELL, M.B., Ch.B.Glasg.

UNSUSPECTED PREGNANCY.

I THINK I ought to record an experience I had about twenty years ago, because of its medico-legal significance.

I was summoned at the last minute to attend a confinement. After the birth of the child, a healthy male, the mother made the following statement: She had been married over eight years, and had been regular each month. Her last period finished two or three days before this unexpected birth. Her figure had not changed in the least; she wore the same stays and dresses throughout with no adjustments or alterations. A short time before delivery she had a little stomach ache, which she ascribed to having eaten a supper. The child was born as the result of one long pain only, and the process was a matter of a few minutes only. The medical attendance merely consisted in division of cord and application of a binder. The husband had no suspicion of his wife being pregnant, and was quite excited and flustered at the unexpected birth.

I also questioned a married woman who had had several children, and who occupied part of the same house. She had not noticed any sign of pregnancy in her friend, neither in figure, dress, nor anything else.

The whole set of circumstances seems almost unbelievable, but I closely questioned all parties concerned at considerable length, and as there was no conceivable reason for speaking anything but the truth I unhesitatingly accepted the statements as facts. I still believe these things to be true in every particular.

London, S.W. JOHN FLETCHER.

A DIPHTHERIA CARRIER.

MISS E. R., aged 28, of robust appearance, had been found to be a carrier of virulent diphtheria bacilli in November, 1921, when an outbreak occurred in a school where she was matron. An autogenous vaccine prepared at Manchester University and also a stock vaccine were administered without effect, as follows:

Three doses of autogenous vaccine, each containing 10 million bacilli, were injected—one each on January 20th, January 27th, and February 3rd; three doses of the stock vaccine were also injected—one of 25 million on February 28th, one of 50 million on March 6th, and one of 25 million on March 17th. Swabs taken on various dates subsequent to the commencement of the injections showed, on culture, the following results:

February	2	...	swab +	March	4	...	swab +
,,	8	...	,, −	,,	16	...	,, +
,,	18	...	,, +	,,	22	...	,, −
,,	25	...	,, −	,,	28	...	,, +

After the dose of 50 million stock vaccine (undetoxicated) there was considerable reaction, and the patient complained of very distressing pain in the region of the heart with a feeling of oppression, but there was no tachycardia, dilatation, or valvular disease. These symptoms had not been present before the use of the vaccine; in fact, the patient had felt perfectly fit. She refused further injections after March 17th.

On March 14th I removed the right tonsil, which was somewhat hypertrophied; the left tonsil was only visible on retraction of the anterior pillar of the fauces. As diphtheria bacilli were still present on March 28th I sent her to Dr. E. H. R. Harries, who reported numerous diphtheria bacilli on the left tonsil and a few from the nose, and recommended dissection out of the left tonsil; this was done by Mr. A. L. Yates on April 21st, and he removed some adenoid tissue at the same time. Swabs taken subsequently showed the following results:

May	10	...	swab +	May	24	...	swab −
,,	17	...	,, −	,,	30	...	,, −

On May 10th a slough was still present in the nasopharynx; after this had separated the swabs were negative. Local treatment after removal of the tonsils consisted of swabbing over the tonsil beds and nasopharynx daily with 10 per cent. argyrol, except on mornings before swabs were taken.

I think this case only emphasizes the uselessness and even harmfulness of vaccines for these cases, and the necessity for thorough removal of any unhealthy tissue, without which the diphtheria bacilli cannot be dislodged.

Wolverhampton. C. L. SPACKMAN, M.B., Ch.B., D.P.H.

Reviews.

CANCER OF THE BREAST.

MR. HANDLEY published the first edition of his book on *Cancer of the Breast* in 1906, and it says much for the thoroughness and care with which his original investigation was conducted that in this, the second, edition,[1] published sixteen years later, there has been need for practically no alteration of any consequence in that section which deals with his pathological work.

The arrangement of the contents of the volume is based on a scientific principle which ought to be more frequently followed. The book begins with a detailed statement of the evidence on which Mr. Handley relies to establish his theory of the way in which carcinoma of the breast is disseminated; later chapters treat of the process of repair in carcinoma, the normal anatomy of the breast, the treatment, operative, by *x* rays, and by radium, and of recurrence. Paget's disease and the dissemination of melanotic sarcoma are discussed in two interesting and illuminating chapters.

The two sections of the book which will probably first attract attention are, curiously enough, neither of them strictly concerned with the main thesis of the volume. Chapter X deals with the anatomy of the breast and its lymphatic glands; here we confess to some feeling of disappointment; in a volume of such excellence and importance place might have been found for a more detailed account of what must essentially form the groundwork of successful pathological investigation. In contrast to this, the chapter dealing with the radiological treatment of carcinoma is one of the best presentations of the subject which we have read. It puts the highly important question in an exceedingly fair light, and we would commend its perusal to all who have anything to do with the radiological treatment of carcinoma. We have only one criticism to make: it would, we think, have been well to have recounted in greater detail the work of Murphy and Rous and their collaborators; Mr. Handley dismisses their investigations very briefly and does not even mention their names; but their results are, we believe, generally considered to be of great significance.

The first chapter deals with the inadequacy of the embolic theory of the dissemination of carcinoma; Mr. Handley is strongly in favour of the view that breast cancer is disseminated by the lymphatic vessels. While he does not deny the possibility of cancer cells entering the blood stream, he believes (and his belief is mainly based on the work of M. B. Schmidt) that the blood exerts so strong a destructive action upon the cancer cells that haemic embolic metastasis is an extremely rare occurrence. Recent experimental work tends to call in question some of Schmidt's results, and we suggest that the papers Czerny published in 1913–14 are of interest in this connexion. With great originality a mass of evidence is presented in favour of the view that the disease is disseminated by way of the lymphatics along the deep cervical fascia. The author draws a clear distinction between spread by infiltration and spread by permeation; the latter is the advance guard of the disease, and by ingenious argument, if not by demonstration, Mr. Handley shows that it is along the smaller lymphatic vessels that the cancer cells primarily extend.

There are not many who will express disagreement with his views, but to a critical mind the demonstration is not so convincing as Mr. Handley would have us believe. Naked-eye evidence, as shown by the skin nodules, is untrustworthy; such evidence can only be obtained in the advanced stages of the disease, and the nodules, therefore, are no criterion of an early process. Microscopical evidence will be convincing when the process, as Mr. Handley describes it, can be demonstrated in a complete series of serial sections. The labour would be enormous, and the observer to undertake it has yet to appear. The examination of a single strip, or even of two radial strips, is not sufficient evidence of what may be occurring in other planes and serials. The author describes his conception of the disease and its spread as being that of a biconvex lens, by which description we may infer that he believes that the dissemination of the disease, while not necessarily circular, is yet radially uniform from a common centre. It is difficult to reconcile this exact conception with

[1] *Cancer of the Breast and its Treatment.* By W. Sampson Handley, M.S., M.D.Lond., F.R.C.S.Eng. Second edition. London: Published for the Middlesex Hospital Press by John Murray. 1922. (Med. 8vo, pp 411; 82 figures. 30s. net.)

what happens in cases of epigastric abdominal involvement. Is it not more natural to assume that there has been a lymphatic dissemination of the disease along one definite line?

There is difficulty also in agreeing with Mr. Handley in his dismissal of the blood route of infection. In those cases which show secondary deposits in the dura further evidence seems to be required to carry conviction that such deposits are explained by a lymphatic dissemination along the deep fascia extending as far as the scalp, and yet giving rise to no other superficial manifestation.

A very interesting and encouraging portion of the book is that which deals with the natural tendency to cure in carcinoma. It is encouraging because we are too apt to be pessimistic where malignant disease is concerned; here again, however, we cannot help wishing that Mr. Handley could show us more convincing evidence of the radial fibrotic cure which he so dramatically describes.

In the section which deals with the principles of the operation for breast cancer we are glad to call attention to the importance Mr. Handley attaches to the too often neglected rule that the primary growth shall always be the central point of the mass of tissue which is cut out in order to remove cancer. Too often the rule is broken in order to ensure a more adaptable scar. We do not find that Mr. Handley has expressed an opinion on the question whether the axillary dissection should precede the removal of the breast and its associated parts. There are many who believe that to introduce the operation by an axillary dissection is a great material advantage. We hope we shall not be accused of levity if we allude to one point which must interest all who play golf—and in these days who does not? In January, 1912, Mr. Handley carried out the radical operation for breast cancer on a lady who, within six months of the operation, defeated her husband, a scratch player, though she was in receipt of only three strokes! Golfing stories, like fishing stories, are always refreshing, and this is one of the best we have heard.

But, apart from these criticisms, golfing and otherwise, we have nothing but admiration for this most excellent volume. The research has been conducted in a most scientific spirit, there is evidence throughout of admirable care and attention to detail, and if on occasion the reader has the feeling that the cloth has been cut to suit the tailor, one must remember that it is a fault to which every original investigator is liable. In future editions we hope that Mr. Handley will give us the benefit of his great experience by recounting further problems of breast pathology in relation to other tumours.

THE PATHOLOGY OF LETHARGIC ENCEPHALITIS.

PROFESSOR TAROZZI'S monograph on non-suppurative encephalitis and so-called lethargic encephalitis[2] is based on observations made on cases during the epidemic at Modena between December, 1919, and January, 1920. The book is mainly devoted to the anatomical, histological, and bacteriological study of the disease, together with an account of the author's experiments on animals. The anatomical and histological observations are divided into three groups. The first comprises those cases which showed symptoms of epidemic encephalitis during life, the diagnosis being confirmed by *post-mortem* examination; the second group consists of cases which came to autopsy with the diagnosis of influenza or acute bronchopneumonia with or without symptoms of cerebral involvement; and the third group consists of miscellaneous diseases. All the eight cases of the first group with one exception showed diffuse lesions of the bronchopulmonary system referable to influenza, and the parenchymatous organs showed degenerative changes due to toxic infection. The lesions in the central nervous system both on naked-eye and microscopical examination presented the appearances characteristic of epidemic encephalitis. Bacteriological examination of the cerebro-spinal fluid was always negative. In six of the twelve cases belonging to the second group a study of the central nervous system showed lesions similar to those found in a more marked degree in encephalitis. In the third group, which comprised eleven examples of various diseases such as tuberculosis, pemphigus, purpura, nephritis, and carcinoma of the pancreas, histological lesions resembling those of encephalitis were found apart from any clinical signs of nervous involvement. The experimental work performed by the author consisted of inoculation of rabbits with pure cultures of diplostreptococci obtained from bronchopneumonic areas in cases of encephalitis. The inoculations were made beneath the dura mater, into the cerebral substance, into the carotid, jugular vein, and peritoneum; the lesions produced were similar to those met with in lethargic encephalitis.

Professor Tarozzi maintains that the anatomical and histological changes of so-called lethargic encephalitis do not differ in any respect from those found in non-suppurative encephalitis, and especially from the encephalitis which may accompany influenza. *Post-mortem* examination of cases of encephalitis always shows the changes in the respiratory tract usually found in influenzal bronchopneumonia. Moreover, in the central nervous system of persons who have died of influenza lesions are found in a marked degree with relatively greater frequency in those who have presented clinical symptoms of encephalitis during life. The histological changes in the central nervous system in lethargic encephalitis are presumably to be attributed to the local action of circulating toxins produced by the diplostreptococci which are responsible for the inflammation in the respiratory tract. There is thus, the author concludes, a close causal relationship between influenza and encephalitis. The hypothesis that influenza merely predisposes to infection of lethargic encephalitis is dismissed as inadequate.

[2] *Sulla encefalite non-suppurativa e la cosidetta encefalite letargica.* By Professor Giulio Tarozzi. Modena: Societa Tipographia Soliani. 1921. (Med. 4to, pp. 99; 6 figures.)

THE POPULATION PROBLEM.

DISCUSSION of the population problem generally excites as violent animosities as debates on psycho-analysis, no doubt because both topics are more or less concerned with a taboo. The fury aroused by Parson Malthus lives in Cobbett's pages, while the more genial satire of Peacock can never lack admirers. Lord Morley tells how Mr. Gladstone withdrew from co-operation with the promoters of a memorial to John Stuart Mill because of a doubt whether Mill had not advocated obnoxious checks to population. Eminent statisticians, even correspondents of the BRITISH MEDICAL JOURNAL, have been a trifle fierce on the theme. Mr. CARR-SAUNDERS[3] possesses the distinction of having devoted a volume of more than 500 pages to this exciting subject without a single lapse from academic decorum and without giving the most sensitive reader cause for anger. He has diligently perused a large number of books and memoirs (his bibliography includes about 1,000 titles) and has attempted to sum up the whole case in the manner of a judge. He has achieved a fair measure of success, although the field he essays to cover is so wide that specialists will no doubt find errors. Actuaries, for instance, will object that neither Macdonell's deductions from the *Corpus Inscriptionum Latinarum* nor the rates of mortality in Price's Northampton Table give any information about that terribly mishandled function, the "Expectation of Life," either in ancient Rome or eighteenth-century England, because the method of calculation was unsound. But not even a diligent Oxonian can be equally well informed on all points. The general reader is likely to be awestruck by the range of Mr. Carr-Saunders's erudition. The harshest criticism such a reader is likely to make is to recall some sentences of Bagehot: "There is as much variety of pluck in writing across a sheet as in riding across a country. Cautious men have many adverbs—'usually,' 'nearly,' 'almost'; safe men begin, 'it may be advanced.'" Mr. Carr-Saunders is cautious and safe, although he has courage enough to dissent from opinions very influentially supported. Perhaps we can best give an idea of the qualities of the book by quoting the concluding passage.

"On the other hand, those who think that germinal change in mental characters will affect the evolution of society and mould the course of history are upon the whole mistaken. The course of history is in the main dependent upon changes in tradition which are for the most part independent of germinal change. Just as the outstanding happenings in the last century—the turning of thought and conduct in Germany, for example, along certain lines, which ended in so great a catastrophe—were due to changes in tradition and not to changes in the germinal constitution, so whether the problems now pressing upon European society are to be solved, or whether some greater catastrophe, reaching a climax in a long course of years or bursting suddenly upon us, is to be the outcome, will depend upon changes in tradition and not upon germinal change. The reason for this lies in the fact that the vast accumulation of tradition overlays the outward expression of mental character, determines the direction of intellectual activity and moulds the expression of the instinctive faculties. But as far as tradition is equalized, so far do innate mental

[3] *The Population Problem: A Study in Human Evolution.* By A. M. Carr-Saunders. Oxford: Clarendon Press. 1922. (Med. 8vo, pp. 516; 21s. net.)

differences manifest themselves as between man and man, and since tradition is more or less equalized, if not within races, at least within classes in the same race, to that degree is mental endowment of pre-eminent importance to the individual."

At first this seems rather bold, a challenge to those who believe Nature more important than Nurture. But when one rereads it, perpends the final sentence, and remarks that Mr. Carr-Saunders defines tradition (on p. 409) as the "product of conceptual thought," one comes to doubt whether it really is so very bold after all. The character of the product must, we should suppose, depend upon what "conceives" it, therefore ultimately tradition *does* depend upon "germinal change." Perhaps the very bad tradition of Germany *was* a consequence of the conditions of selection a generation ago, which Mr. Carr-Saunders allows (on p. 464) to have played some part—his cautious words are, "may have played a minor part."

In fact, Mr. Carr-Saunders's caveat against the eugenists is a very mild one indeed. Perhaps all it really amounts to is this. When, as in Rome, a small number of highly intelligent and cultivated persons was surrounded by a vast population of entirely uncultivated and quasi-barbarous persons, the mutual destruction of the intelligent minority led to chaos; there was no sufficient tradition—using the word in a slightly different sense from that of Mr. Carr-Saunders—to keep the machine working. In a modern State this could not happen. If every educated Englishman were shot to-morrow the means of knowledge are so widely disseminated that, within a few generations at most, there would be a recovery to the original position.

Upon the narrower issues, the question of checks to population and the determination of the optimum population, Mr. Carr-Saunders is again a cautious but not inspiring guide. It may be a bold thing to say of any book on the population question, but we will predict that this work will not excite violent controversy.

X-RAY DOSAGE.

The Principles of Physics and Biology of Radiation Therapy[4] is an English translation of Krönig and Friedrich's book made by Dr. Henry Schmitz, Professor of Gynaecology at the Loyola University School of Medicine, Chicago. The original German edition was published in 1918, but the translation has been brought up to date by the addition of accounts of various investigations made by Friedrich and his assistants since that date; this, the translator states, has been done in order to demonstrate the important bearing of the original work upon the progress and development of radiation therapy.

Some idea of the comprehensive character of this publication can be gathered from the material which constitutes the two main portions. Part I, dealing with the physical principles of radiation therapy, is largely concerned with the question of dosimeters, and an instrument is described which appears to conform to all the demands of radiotherapy; there is a unit of dose and a method to gauge the scale of the dosimeter based upon this unit. The experiments made in order to perfect the iontoquantimeter are described in detail, together with errors of construction which have to be guarded against. An extraordinary number of experiments are detailed in this part of the book, ranging from those concerning the reliability or otherwise of Kienböck strips, the Sabouraud pastille, and the Fürstenau intensimeter, to those carried out in order to make a comparison between the depth dose calculated from the surface dose and the depth dose measured in the water phantom, and also experiments carried out with x rays filtered through 1 mm. of copper at different depths and with different sized fields. The number of tables of these various results is somewhat bewildering to a reader who is not an expert physicist.

The second part is occupied with the biological principles of radiation therapy, and is in effect an attempt, with the aid of the measuring methods described in the first part, to define the laws which govern the action of x rays and of radio-active substances on biological objects. Realizing that laws could not be framed without much preliminary investigation on the lower forms of animal and vegetable organisms, a large number of experiments were first of all made on frog larvae, and these are the subject of the opening chapters of this section.

Having convinced themselves that definite laws for the biological action of the various types of x ray could be founded on these experiments, the authors in the following chapter deal with their investigations made on human tissues; the three tissues chosen are the skin, carcinomata, and the ovary. Detailed accounts of experimental work on these three tissues, chiefly of the action of x rays through filters of 3 mm. aluminium or 1 mm. copper, occupy succeeding pages, and comparisons are made with the biological action of the gamma rays of both radium and mesothorium. All this part of the work is of the greatest interest and importance to the radiotherapeutist, and its arrangement is such that it is easily followed and understood. In each experiment the aim is first of all stated, then a short account of the details of the actual experiment is given, together with, in some cases, the control observations; finally the results and their bearing on the subject are summarized. This part concludes with an account of the methods of arriving at the sensibility quotient for the ovary and for carcinoma, and notes on the dependence of the intensity of the biological action on the same dose.

With regard to the main conclusions which are the outcome of all this work, it is definitely laid down that the average erythema dose can be, and is, determined; but that at the same time undersensibility as well as oversensibility can be proved to exist: the former, pronounced undersensibility, is frequently observed in very old, decrepit, and markedly cachectic individuals, even up to the amount of 100 per cent. The conclusion as to the ovary is that if the dose recommended to produce amenorrhoea is administered the age of the patient is practically of no importance—the successful result must follow on the dose. In carcinoma in some cases a tumour would completely disappear to the senses of sight and touch, whilst in other cases the tumour was refractory in spite of the same x-ray dose. The reasons for the great individual differences in this respect are unknown.

It is impossible to do more than give a general impression of the scope and the value of the experimental work detailed with so much care and exactness. The value of the book to the radiologist and especially to the therapeutist is obvious; it is well got up, printed in excellent type with large margin, and the illustrations, chiefly diagrammatic, are very good.

[4] *The Principles of Physics and Biology of Radiation Therapy.* By Drs. B. Kroenig and W. Friedrich. Appendix and the English translation by Dr. Henry Schmitz. London: William Heinemann (Medical Books), Ltd. 1922. (Demy 4to, pp. 271; 31 plates, 86 figures. 42s. net.)

NOTES ON BOOKS.

THE *Handbook of Tuberculosis Schemes for Great Britain and Ireland*, edited by the National Association for the Prevention of Tuberculosis,[5] which has now reached its third edition, is a mine of useful information. Collected within its pages are facts and statistics which could only be obtained by the individual after an altogether unreasonable period of reference hunting. Classified in an admirable manner, and reproduced in the minimum of space consistent with clarity, are lists of all the tuberculosis schemes for the British Isles, together with the area, population, industrial occupation, and death rates from all causes—and from tuberculosis in particular—of each district concerned. In ten charts are given the death rates from tuberculosis—pulmonary and other forms—for 1920 in Great Britain, the age and sex distribution for the last sixty years, and the fall in the death rate for the same period. The information in regard to Ireland is somewhat meagre, but the figures alone are sufficient to indicate the backward state of that country in relation to tuberculosis administration. A tabulated plan of schemes laid out for counties and county boroughs, and a complete list of residential institutions—both official and voluntary—for the treatment of tuberculosis, giving the number of available beds and the class of case to which admission is restricted, conclude the book. We have no hesitation in recommending it to all who are interested in the progress of the campaign against tuberculosis in this country. As a handbook for the information which it is intended to supply it will prove invaluable.

Dr. FERDINAND HUEPPE, of the German University of Prague, has edited a second edition of his book on physical training.[6] This is concerned largely with training for sport, and the author goes into the subject fully from both the physiological and practical sides. The book is illustrated by a number of reproductions of photographs of Greek statues and modern athletes, and discusses the various types such persons may present.

[5] *Handbook of Tuberculosis Schemes for Great Britain and Ireland.* National Association for the Prevention of Tuberculosis. Third edition. London: Adlard and Son and West Newman, Ltd. 1921. (Med. 8vo, pp. v+275; 10 charts. 10s. net.)

[6] *Hygiene der Körperübungen.* By Dr. Ferdinand Hueppe. Leipzig: S. Hirzel. (Demy 8vo, pp. 282. The price at which German books are supplied in this country should be ascertained from an importing bookseller.)

British Medical Journal.

SATURDAY, SEPTEMBER 16TH, 1922.

SOME PROPRIETARY VITAMIN PREPARATIONS.

THE literature about accessory food factors grows apace, and not only are newspaper readers becoming familiar with the idea of vitamins, but the attention of manufacturers of foods and drugs has been attracted, and some of them have sought to turn the idea to commercial purposes in a manner which must be pronounced to be at least premature. To preserve foods so that the vitamins they contain when fresh are not destroyed is difficult; to obtain vitamins in concentrated form must therefore be still more difficult. The enterprise of manufacturers is being displayed on both sides of the Atlantic, and the *Journal of the American Medical Association* recently contained two articles giving the results of independent scientific experiments made to measure the vitamin content of certain proprietary articles advertised as containing vitamins. Not all the articles studied are known on this side of the Atlantic, but the principle involved is of general interest, and we therefore propose to give a short account of certain results obtained by investigations carried out in the departments of pediatrics and pathology of the University of Illinois College of Medicine, Chicago, and in the department of chemical hygiene and public health of Johns Hopkins University.

Vitamin C, it will be remembered, is antiscorbutic, and vitamin B is generally spoken of as the antineuritic or antiberi-beri vitamin. Drs. Julius H. Hess, J. J. Moore, and J. K. Calvin,[1] at Chicago, measured the amount of vitamin C and vitamin B contained in certain preparations advertised in America; the preparations examined included "Metagen" (Parke Davis), "Mastin's vitamon tablets," and "Yeast Vitamine-Harris"; in the last preparation only the vitamin B content was measured. They concluded that "Metagen as obtained on the open market contains no demonstrable amount of antiscorbutic substances, as shown by experiments on the guinea-pigs. The effect of the ageing of this product after leaving the manufacturing laboratory may be of importance." They found that Metagen contained vitamin B, but that it was less efficacious than fresh yeast in preventing and curing polyneuritis in pigeons. "Yeast Vitamine-Harris" contained nearly as much vitamin B as did fresh yeast, while "Vitamon" contained only a small amount of vitamin B. Neither of the last two preparations contained appreciable quantities of vitamin C. Their final conclusion was: "It appears from the foregoing experiments that the process of manufacture and subsequent ageing of the concentrated vitamin products have not caused as much deterioration of the antineuritic as of the antiscorbutic properties. All the products studied were very low in antiscorbutic properties, and while all of them contained water-soluble B, they had a much lower potency than fresh yeast, with the possible exception of the Yeast Vitamine-Harris preparation."

McCollum and Simmonds[2] examined six products—Mastin's yeast vitamon tablets, "Yeast Vitamine-Harris," "Double Strength" yeast and iron concentrate, Irving's Phos-pho vitamine, Alpha vitamine tablets, and "Super-vitamin" tablets. They tested these products for the presence of vitamin B, which is the most stable of the three vitamins, and therefore the one most likely to survive the processes of manufacture. From the dose recommended by the manufacturers for an adult they calculated the proportional dose required by a rat, and then tested these products by giving twenty times the calculated dose to young rats kept on a vitamin B free diet. The presence or absence of vitamin B in the preparations was indicated by the presence or absence of growth in the rats. Five of the products tested were found to contain, at the most, only traces of vitamin B, whilst the sixth preparation, "Yeast Vitamine-Harris," contained a moderate quantity of vitamin B.

These results confirm the expectations of all who have worked with vitamins. These bodies are very unstable, and hitherto it has been found practically impossible to concentrate them in the laboratory. Vitamin C is rapidly destroyed by any chemical treatment. All attempts to concentrate vitamin A have hitherto failed, and it is extremely difficult to concentrate vitamin B, although this is the most stable of all the three vitamins. Hence it would be very surprising if any manufacturer had succeeded in producing concentrated vitamins in a stable form on a commercial scale. The experiments quoted show, in fact, that some of the preparations tested are practically free from vitamins, and that the others contain less vitamin than ordinary yeast. McCollum, in his article, points out that a well-planned diet will afford an abundance of vitamins, and that there is no evidence that an excess of vitamins can produce any beneficial therapeutic effect; hence, even if the production of concentrated vitamins in a stable form were found to be a possible commercial undertaking, there is at present no evidence to show that such preparations would be of any definite therapeutic value. But, as McCollum says, "There prevails in the minds of most people, however, a childlike confidence that these substances [vitamins] must have a medicinal value." After pointing out that some manufacturers are offering for sale "extracts which purport to supply vitamins in concentrated form," he continues: "The extensive advertising of such nostrums, and the reports of druggists as to the extent of the demand for these products, leave no room for doubt that there is a great demand for them, and at fancy prices."

McCollum is fully alive to the fact that a human being can only thrive when fed on a diet containing a sufficient supply of vitamins, and observes that the concentration of populations in towns has resulted in our diet consisting essentially of highly milled cereal products, muscle meats, potatoes, and sugar. Such diets are insufficient to maintain animals in health and are proving a failure in the case of children. Such diets should be supplemented by vitamin-rich foods, of which the most important are milk and milk products, green vegetables, and fruit—substances which McCollum designates as "protective" foods. He advises that a diet should include salads twice a day, a liberal helping of cooked green vegetables once a day, and the equivalent of a quart of milk as milk or milk products.

If these statements are to be accepted as representing the approximate quantities of protective foods required to maintain full health, and we are not disposed to quarrel with them, it is obvious that the great majority of our urban populations are living on a diet deficient in vitamins. This deficiency is to be remedied by dietary reform.

[1] Experimental Studies with Proprietary Vitamin Products. J. H. Hess, J. J. Moore, and J. K. Calvin. *Journ. of Amer. Med. Assoc.*, vol. lxxviii. p. 1441 (May 13th, 1922).

[2] The Potency of Commercial Vitamin Preparations. E. V. McCollum and N. Simmonds. Ibid., vol. lxxviii, p. 1953 (June 24th, 1922).

THE EPIDEMICS OF EASTERN EUROPE.

WE have received a copy of a new pamphlet, *Epidemiological Intelligence*, No. 3, published by the Health Section of the League of Nations,* relating to the epidemic situation in Russia and Eastern Europe. This is a continuation of previous pamphlets on the subject, and it supplements the shorter bulletins which are now furnished to the public health departments of different countries about every ten days. It contains an analysis of the reports of the several national delegations to the European Health Conference at Warsaw which was held in March of this year, and a summary of the present state of health defence in the European sanitary zone. Contact between the Health Section of the League and its Epidemic Commission on the one hand and the Russian health authorities on the other was established in September, 1921, and has since been maintained and extended. The "People's Health Commissariat" of Soviet Russia places at the disposal of the Health Section facilities for collecting epidemiological intelligence, and all kinds of Russian publications are supplied regularly to Geneva.

From the information contained in this document and associated bulletins it is only too obvious that the epidemic situation in Russia and the border States continues to be very grave. Typhus and relapsing fever are stated to have been responsible for at least two million cases officially reported during the first five months of the year. The seasonal fall in typhus incidence at the end of last winter was not very pronounced in Russia as a whole. The number of cases is said to remain actually at the winter level in the Ukraine. The case mortality from this disease is estimated to be considerably higher than the average of the last three years. New centres of cholera are also being discovered in Russia and the Ukraine, seventy provinces now being involved to greater or less degree. The disease has spread mainly along railway lines, and to a large extent has been carried by railway employees and also by refugees. It has not so far assumed the proportions of last year's extensive outbreak; the most remarkable epidemiological feature is perhaps the continuous character of its progress. It seems that preventive vaccination has been carried out on a large scale in certain parts of Russia. Cholera has not spread extensively beyond the frontiers of the Soviet territories, but there have been several cases at the Polish quarantine station at Rovno, and one or two are reported farther west traceable to direct contact from this station.

The Health Committee of the League of Nations, at its recent August sitting in Geneva, received this report and the report of the special Epidemic Commission of the League which has been working in the frontier areas for the last two years. The Committee decided to direct the immediate attention of the Council (now in session) to the following considerations in order that all practicable action may be taken without delay: (*a*) "The Committee has no reason to modify the estimate of the gravity of the situation in Eastern Europe in regard to the spread of typhus, relapsing fever, cholera, and other epidemic diseases which it expressed in May last." (*b*) "The way in which international measures can be applied so as to combat these diseases successfully is well known. The benefit of such measures is incontestable. The experience of the Health Organization and of its Epidemic Commission is available. In short, the field for successful international effort is limited only by the question of the money and material which can be secured." (*c*) "As a practical matter, it is essential to have a programme for immediate action limited as strictly as possible to the most urgent necessities. In the opinion of the Committee, the work of the Epidemic Commission during the winter 1922–23 should primarily be concentrated within a zone which includes the States bordering Soviet Russia and the Ukraine on the west, together with a defined portion of Soviet Russia and the Ukraine itself. Within this area the advantages to be derived from international effort are greatest and the need most urgent, and this work should be carried out by enabling the Epidemic Commission to continue and develop its work on the lines which it has so successfully followed during the last two years. Attention is also needed to the prevention of the spread of cholera from Black Sea ports." (*d*) "The invaluable work of the Epidemic Commission has been carried out by means of a total sum of about £200,000, now practically exhausted. New funds must be found at once to carry out the limited programme outlined above. The Health Committee begs the Council to use all its efforts to obtain fresh funds for the purpose at the earliest possible date."

The British Government, we understand, has already promised a contribution of £100,000 (or less amounts in proportion) for the continuance of this work, subject to the condition that £100,000 is forthcoming from the other nations contributing. The great importance to all Western European nations of the maintenance and enlargement of the sanitary zone on the borders of Russia, whilst that country and the Ukraine remain so huge a source of infection, and especially whilst repatriation is still incomplete, will be obvious to all who read this latest pamphlet. The work done by the Epidemic Commission has evidently been of the greatest value. It represents a co-ordination of effort which no other organization could at present attempt to supply, and we wish the Health Committee and the League every success in their attempts to stir the nations to work, not only of the highest humanitarian value, but vitally important in their own defence.

Space does not permit us to do more than draw attention to many interesting epidemiological features in this pamphlet, such as the peculiar alternation between the epidemics of scarlet fever and typhus fever in Rumania, and the strange variations in virulence as shown by case mortality rates in several of the diseases. We note that it contains also a useful summary of influenza mortality in European cities. This might with advantage be published separately from the epidemic diseases of Eastern Europe; it would be particularly appropriate as a contribution to the *Bulletin* of the Office International d'Hygiène Publique, which is already a mine of information on the occurrence and type of influenza throughout the recent pandemic.

* Obtainable through Constable and Company, 10, Orange Street, W.C.2.

THE SENSE OF SMELL.

THE possession of a sense of smell is one of our natural gifts, but the possession of any knowledge concerning that sense belongs to few. Owing to the inherent and obvious difficulties of the matter investigations have been relatively scanty. Yet the literature of neglected subjects such as this is, none the less, not barren. Various attempts have been made to classify odours and to explain the mechanism by which they reach our consciousness. Of classifications of smells the simplest, and that which will most appeal to the average man, is that of Haller, who in 1763 made them into three classes — agreeable smells, intermediate smells, and disagreeable smells. So might Falstaff himself have described smells, and by this rule our public authorities work to this day—to our great profit.

In more recent years valuable contributions have been made by Zwaardemaker,[1] whose work created considerable

[1] *Physiol. des Geruchs*, H. Zwaardemaker, Leipzig, 1895; and *Geruch und Geschmack*, Handb. der physiol. Methodik, Leipzig, 1910, vol. iii.

discussion, and whose olfactometer, described in our columns many years ago, opened up wider fields for research. In a thesis recently presented to the University of Brussels, A. Heyninx,[1] in a handsome and well-documented quarto, attacks the problem anew. Zwaardemaker had done a service in reducing the somewhat vague sense of smell to something measurable and capable of clinical application. He had classified odorivectors, and had shown, moreover, that in the same class of odoriferous bodies identical or similar intramolecular groupings are found. But the chemical formulae may vary greatly, and yet a similar smell result—for example, hydrocyanic acid and nitrobenzol have the same odour of bitter almonds.

Heyninx attempts to put the olfactory sense upon a rigid physical basis. In the first place, he laments that we can only speak of smells by periphrasis—by comparing a given smell with that emitted by some well-known object. Before the discovery of the monochromatic elements of the solar spectrum it was by such roundabout means that colours were designated. Indeed, Heyninx wishes to set up a spectrum, as it were, for smell with a classification dependent on variations in the wave-length. By ingenious and closely reasoned argument, betraying considerable knowledge of physical chemistry, Heyninx arrives at the conclusion that the activating mechanism of odours is by the vibration of wave-lengths, the same as those of the ultra-violet part of the solar spectrum. He is attracted by Castelli's theory of resonance in vision—the resonance of the retinal pigment granules in response to waves of light. He uses this theory to explain the pigmentation of the olfactory mucous membrane, and finds that the size of the pigment granules corresponds roughly with the wave-length which odorous bodies emit. An important argument in this connexion is contained in a paper by Ogle[2] on anosmia; he states that albinos, who have no olfactory pigment, have no sense of smell. Heyninx describes his experiments on the excitor mechanism of olfaction; they show that it is not a radio-active energy, nor a chemical, nor a colloidal, nor a spectral absorption, but a moleculo-vibratory energy which activates our affective paths.

Dr. Heyninx's contentions are deserving of attention, and his large and extremely well produced book will be found a mine of information with a rich bibliography.

THE GOVERNMENT LABORATORY.

An important though little known department is that of the Government chemist, otherwise known as the Government laboratory. The present establishment consists of the Government chemist and his deputy, with five superintendent chemists, nine chemists class I, twenty-three chemists class II, and thirty-six temporary assistant chemists. A brief sketch of the manifold activities of his department is given by Sir Robert Robertson, K.B.E., D.Sc., F.R.S., in his report for the year ending March 31st, 1922.[3] The chemical work of some fourteen Government departments is now done wholly or in part in the laboratory at Clement's Inn Passage. The other laboratory at the London Custom House deals especially with customs samples; but to avoid delay in examination "chemical stations" have been established at the more important seaports, where samples are tested by customs and excise officers who have been trained at the Government laboratory for this purpose. There is also a laboratory at Deptford for the inspection of War Office food stores and supplies. In all, more than 300,000 samples are examined every year. Much extra work has arisen in connexion with the Safeguarding of Industries Act, the Dangerous Drugs Act, and the Dye Stuffs (Import Regulation) Act. The work undertaken for the Ministry of Agriculture and Fisheries includes the analysis of a great many samples of dairy produce and margarine. Under this heading we note that the amount of fat in various samples of condensed milk ranged from 7.15 to 10.6 per cent., with a corresponding variation in the proportion of non-fatty solids, indicating that one tin might contain half as much again of milk products as another of the same size; minimum limits for condensed milk have, however, not yet been adopted in this country. The work of investigating the degree of pollution of river water and effluents is increasing, and much has been learnt regarding the proportion of toxic constituents in tar extracts and washings. On behalf of the Crown Agents samples of medicines and drugs taken from supplies for various colonies are examined to see whether they conform to specification. A considerable amount of work is done in determining the gravity of beer for the assessment of duty, and many samples of beer are examined for suspected dilution. Of 481 samples of beer and brewing materials investigated for the presence of arsenic, 24 were found to contain arsenic in excess of the limits laid down by the Royal Commission on Arsenical Poisoning. Of 86 samples of matches examined, none contained any evidence of the presence of white phosphorus. For quite other reasons a watchful eye is kept also upon liqueur chocolates and other confectionery suspected of containing alcohol; "many, however, contained only highly flavoured cream interiors, the presence of spirit being due to association with the flavouring essence used." Claims for rebate on alcohol used in making medicinal preparations are referred to the Government chemist by the Commissioners of Customs and Excise; also applications for duty-free alcohol for use in manufactures, teaching, and research. Analyses of the intake and output of illicit stills numbered only 29; this must be in sharp contrast with the corresponding work imposed upon the corresponding department in the United States. We note, too, that none of the "non-alcoholic" wines analysed showed more than 2 per cent. of proof spirit. Medicated wines to the number of 33 were examined, but the result is not recorded, and 33 samples of partially fermented grape juice were classed for duty as wines. This department is called upon also to decide whether a wine of doubtful effervescence is to be rated as still or sparkling. The Post Office employs it to safeguard the purity of the materials used in making stamps, and the Board of Trade to keep watch over the lime juice and lemon juice for crews of ships at sea. An immense amount of tea is examined on its arrival in order to ensure that only that which is fit for human food shall pass into the country. Rejected tea is allowed duty free for use in the manufacture of the alkaloid caffeine; in such cases the tea must first be denatured (usually with lime and asafoetida) under the supervision of customs and excise officers. The impression given by this report is that the Government laboratory is almost as useful a friend to public health as it is to the public purse.

THE BRITISH RED CROSS SOCIETY.

In a preface to the Second Report of the Joint Council of the Order of St. John of Jerusalem in England and the British Red Cross Society, the chairman, the Hon. Sir Arthur Stanley, states that in pursuance of its policy "to bring home to the minds of men, women, and children throughout the United Kingdom the vital importance of the prevention of disease" the Council has instituted health lectures to women in rural areas; a syllabus of seven lectures was prepared, dealing with such subjects as general physiology, the digestive system, the skin, hygiene of the home and the village, personal health of the family—child, school boy and girl, and father and mother. The scheme was carried out in nine counties, and has been so much appreciated that requests have been received for its extension to over twenty others during the ensuing winter. Certain medical dépôts have been established to supply sick-room requisites on loan to poor people unable to buy them.

[1] *Essai d'olfactique physiologique.* By A. Heyninx. Thèse présentée à la Faculté de Médecine de l'Université libre de Bruxelles. Brussels: F. Larcier. 1919. (9 × 12½, pp. 289; 21 figs.)

[2] Ogle, BRITISH MEDICAL JOURNAL, 1870, i, p. 166.

[3] Obtainable from H.M. Stationery Office, Imperial House, Kingsway, W.C.2. 1s. 7½d. post free.

The Joint Council's Emergency Help Committee has done much work during the year under review (ending March 31st, 1922). It was established in December, 1920, to administer an initial grant of £100,000 by the Joint War Finance Committee for relief of sick and disabled ex-service men in distress. The scheme in its working illustrates admirably the great advantages of cordial co-operation between Governmental and voluntary agencies. Gaps exist in the administration of the Ministry of Pensions scheme, and these can within limits be filled from the emergency fund. It has been administered by county directors, who report monthly to headquarters, and notes on the experience so gained are in turn reported and circulated for general guidance. Inquiries showed a unanimous opinion in favour of its continuance in all parts of the country for six months at least; at the end of that time (September 30th) the position will be reviewed. Relief of widows and dependants is, within limits, included in the scheme, and for that object there is co-operation with the Soldiers', Sailors', and Airmen's Families Association and the United Services Fund. Of the work of the Home Service Ambulance Committee we recently gave a full account. It now has 309 ambulances, and the number of patients carried in the year was 53,743. Voluntary workers have rendered valuable service in the skilled removal of patients. Ambulances have been stationed at the Pensions Ministry's hospitals at Shepherd's Bush and Roehampton for transport to and from omnibus and tramway termini, and have carried jointly over 118,000 cases. Charges are made to patients able to pay, and in this way much of the cost has been defrayed. In those districts in which there is a deficit it is made good by voluntary subscriptions. Hospital services by the Council have included, at the request of the Government's Disposal and Liquidation Committee, the classification, display, and sale of surplus medical stores. The civil hospitals made purchases to the value of about £50,000. A report dealing with the work of the provincial hospitals in 1921 is to be published shortly. In April, 1921, an emergency call at twenty-four hours' notice was received by the V.A.D. Department from the Admiralty to post 300 nursing members to the three principal naval hospitals to take the place of naval ratings called away in connexion with a labour strike; the nurses remained on duty for ninety days. The amount spent under the V.A.D. scholarship scheme was over £43,000; the balance remaining is over £9,000. The students still in training number 144. The report deals also with the Stores and the Trained Nurses Departments. The Finance Committee's report shows that bad as the times are such splendid organizations as compose the Joint Council can still make successful appeal to the benevolence of Britain, and indeed in some degree to that of the four quarters of the globe.

PUBLIC HEALTH IN THE MALAY STATES.

THE population of the Federated Malay States at the census of 1921 was 1,298,292, as compared with 1,093,781 in 1911 and 678,595 in 1901. There were 5,466 females to every 10,000 males, as compared with 4,302 in 1911, the male population increasing by 18.1 per cent. and the female by 53.4 per cent. The number of births recorded was 36,294, and of deaths 38,077, the rates being 27.81 and 29.18 per mille respectively. The death rate of the four principal towns (Kuala Lumpur, Ipoh, Taiping, and Seremban) is far too high. Infantile mortality and overcrowding are the main causes. The deaths of children under 1 year numbered 6,646, giving an infantile mortality rate of 183 per mille. An Infant Welfare Advisory Board, under the chairmanship of the chief secretary, Mr. W. G. Maxwell, C.M.G., hopes to effect some good. Malaria was as usual the chief cause of sickness and death. The number of deaths recorded from this cause was 17,168—a considerable decrease from the 20,595 deaths in 1920, but still nearly half the total for all diseases. The death rate was 13.16 per mille, as compared with 15.24 in 1920. Malaria, however, is a factor in many deaths attributed to other diseases. The Malaria Advisory Board meets every month, and almost every district has a Mosquito Destruction Board. Any estate can obtain an anopheline survey free of cost, together with a report and the health officer's recommendations; but antimalarial measures on estates, to be effectual, must be carried out under the direct supervision of the estate medical officer. The District Mosquito Destruction Boards carry out destruction work in the town areas, villages, and kampongs. The central Malaria Advisory Board advises generally, and controls and co-ordinates the work of the district executive boards. Antimalarial work on estates is the duty of the owners of the estates. It is essential that there should be a policy of combined action by contiguous estates in respect of antimalarial measures, and the Malaria Advisory Board is endeavouring to achieve this. Where antimalarial works are carried out under expert supervision upon an estate, and some State land or small holdings ought also to be treated, the Government makes a fair contribution. The antimalarial works at Kuala Lumpur cover 6,600 acres, and were maintained at a cost of 22,126 dols.; the cost of new works was 105,000 dols. The Port Swettenham antimalarial area of 3,100 acres was maintained at a cost of 4,623 dols. At Seremban a drained area of 1,500 acres was maintained at a cost of 8,283 dols. Surveys at Taiping, Kuala Lumpur, Gemas, and Raub were carried out over an area of 2,600 acres. During the year there were in the various hospitals and asylums 166,785 indoor patients, as compared with 120,879 in the preceding year. Outdoor patients numbered 275,783 in 1920. The increase in the number of out-patients and the decrease in the number of in-patients are largely due to the establishment of dispensaries in crowded quarters of towns. The value of novarsenobenzol in venereal diseases is recognized by the coolie class, and they are insistent upon treatment by injection. The same drug is used with great success in the treatment of yaws; 8,547 injections were given in Perak, 578 in Selangor, 21,179 in Negri Sembilan, and 903 in Pahang. In Perak 75 cases of small-pox were reported; by energetic action the outbreak was stopped. At the Institute of Medical Research special investigations are in progress into the occurrence of cases of malaria resistant to quinine, and into the value of "cinchona febrifuge" as compared with quinine. The special inquiry, commenced in 1920, into the pathology and treatment of dysentery was continued in 1921. Further investigations were made into melioidosis (pseudo-cholera) and reactions for syphilis. A study of the distribution of anophelines and the seasonal prevalence of species has suggested that the distribution of species may depend on the nature of the food material available in the breeding places—that is, on the algae and other microscopic organisms, and that these in their turn possibly depend on differences in the chemical constituents of the water. The annual reports of the Institute of Medical Research may be obtained free of charge upon application to the Superintendent, Printing Department, Kuala Lumpur.

THE "CREATION" OF "SIBSON'S NOTCH."

IF it be true that a prophet is not without honour save in his own country, there is the consolation that he may possibly get undeserved credit in a strange land. This appears to have occurred in connexion with Francis Sibson (1814–1876), physician to St. Mary's Hospital, who wrote much on diseases of the pericardium, especially in Russell Reynolds's *System of Medicine*, but is scarcely remembered by the present generation, except perhaps for the copious reproductions of his observations in the article on "Diseases of the pericardium" by the late Dr. F. T. Roberts in Allbutt's *System*. In a recent paper entitled "La question de l''encoche' de Sibson," Dr. Germain Blechmann[1] gives an interesting account of the "creation" of the supposed sign "Sibson's notch," which is defined in Dorland's American *Illustrated Medical Dictionary* as "an inward bend of the left upper limit of precordial dulness in acute pericardial effusion." Though not known in this country it appears to be a familiar term in French literature, having in a textbook on

[1] Blechmann, G.: *Rev. de méd.*, 1922, xxxix, 5-18.

cardiological diagnosis published last year even undergone an evolution into "encoche de Gibson"! The responsibility for the creation of Sibson's notch has been traced by Blechmann to the famous Potain, who in 1887 gave an account of the bun-like dullness characterized by Sibson's notch at the base of the heart in pericardial effusion. The explanation appears to be a mistranslation of Sibson's statement that "the pericardium in fact yields sideways under the pressure of fluid, and *encroaches* so far on the left lung as to push it backwards, almost out of sight." Indeed, as Dr. Blechmann points out, Sibson's notch is a fiction for two good and sufficient reasons: in the first place because he never described it, and secondly because it does not occur. The tradition of Sibson's notch shows that even in these days authority may exert undue weight, and that percussion, though a century old, still presents difficulties.

THE CAMPAIGN AGAINST VENEREAL DISEASE IN BELGIUM.

A REPORT has recently been issued of the Conference on the Venereal Diseases held in December last in Paris, under the auspices of the League of Red Cross Societies. Most of the important Western and Eastern European countries were represented, and the two volumes in which this Report is published, together with the report of the Northern European Red Cross Conference for Combating Venereal Diseases held in Copenhagen in May, 1921, constitute a fairly comprehensive survey of recent activities directed against the venereal diseases throughout Europe. A perusal of the speeches of the various delegates leaves the impression that in several countries the campaign, as a definitely organized movement, has hardly begun; and as was to be expected, the efficiency of the various organizations appears to be proportional to the cultural level the different European countries have reached. But whether the delegates spoke of actual achievements or pious hopes, all expressed the belief that recent advances in our knowledge of syphilis were so considerable, and the prospects of controlling it and stamping it out now so promising, as to justify a completely new start, with all the forces of a civilized community converging on this one subject. The paper read by Professor Bayet and Professor Malvoz, delegates for Belgium, may be taken as a fair sample of this modern movement. They pointed out that the arsenical group of drugs is capable of reducing the period of greatest infectivity of syphilis from months to weeks, and argued that if this period could be reduced by three-quarters or four-fifths, an equivalent reduction might be made in the number of infectious persons. The programme of the Conseil supérieur d'hygiène de Belgique, adopted in August, 1920, may be said to pivot on this argument, and therapeutic sterilization of infected persons is regarded as the most effective prophylaxis possible. In translating this principle into practice, the Belgian authorities provide arsenical antisyphilitic drugs free of charge on request, whether the applicant be poor or not. Another step of far-reaching importance is the inclusion of every practitioner in the campaign; in the past the treatment of syphilis was chiefly in the hands of specialists, and was conducted at hospitals. Now, dispensaries are being opened, the objects of which are to provide the general practitioner with all the aid he needs. He may send his patients to be treated there, or he may use the dispensary only for consultation and diagnosis, keeping treatment in his own hands. Although fulfilling the functions of a diagnostic, therapeutic, and registration centre, these dispensaries are run on the principle that administrative formalities of a deterrent character should interfere with their popularity as little as possible. Other items in the campaign are a scheme of educational propaganda, the constitution of a medical advisory board, and the development of an organization for the care of the victims of syphilis. Only brief reference was made to gonorrhoea in this programme, but doubtless much of the machinery provided for the campaign against syphilis could be adapted to the control of gonorrhoea. Both the Belgian delegates spoke of syphilis as a disease on which modern science has a stranglehold, and maintained that it is gradually losing its character as a highly infectious disease with cutaneous and mucous manifestations, being rendered comparatively uninfectious by the arsenical drugs. In this connexion they stated that a diminution in the ratio of primary and secondary syphilis to tertiary syphilis could be noted.

GRADUATE INSTRUCTION IN LONDON.

THE further series of post-graduate lectures arranged by the Fellowship of Medicine and Post-Graduate Medical Association for next session will begin on Wednesday, October 11th, when the opening lecture will be given by Sir James Galloway on "The symptoms and treatment of certain unexplained granulomatous diseases." Dr. Eric Pritchard and Dr. C. E. Lakin will give lectures during October, and the complete programme up to December 13th will be published shortly. As already announced, a special course in tropical diseases will be given at the London School of Tropical Medicine from October 2nd; it will consist of twelve meetings, distributed over four weeks, on Mondays, Wednesdays, and Fridays, from 2 to 4 p.m. The syllabus will be available shortly. Owing to the nature of such a course, the class must consist of not fewer than four members, and it is therefore necessary that those desiring to join should notify their intention of doing so as soon as possible to the Secretary, Fellowship of Medicine, 1, Wimpole Street, W.1.

THE Harveian Oration will be delivered before the Royal College of Physicians of London by Dr. Arnold Chaplin, on Wednesday, October 18th, at 4 p.m., at the College, Pall Mall East. The Bradshaw Lecture will be delivered by Sir Maurice Craig, on "Mental symptoms in physical disease," on Thursday, November 2nd, at 5 p.m. The FitzPatrick Lectures will be delivered by Dr. R. O. Moon, on "Philosophy and the post-Hippocratic school of medicine," at 5 p.m. on Tuesday and Thursday, November 7th and 9th.

DR. GEORGE HASWELL WILSON, lecturer in bacteriology at the University of Glasgow, has been appointed to the Chair of Pathology in the University of Birmingham, rendered vacant by the election of Professor J. Shaw Dunn to the corresponding post in the University of Manchester.

THE John Elliott Memorial Pathological and Bacteriological Laboratory at the Chester Royal Infirmary will be opened to-day (Saturday, September 16th), at 4 p.m., by Sir Humphry Rolleston, K.C.B., M.D., President of the Royal College of Physicians of London. The laboratory has been fitted and equipped by public subscription in memory of the late Dr. John Elliott, Honorary Physician to the Infirmary from 1895 to 1921.

THE late Dr. W. H. R. Rivers, F.R.S., left estate of the gross value of £2,655. He bequeathed to St. John's College, Cambridge, of which he was a Fellow, the portrait of himself by Shields; to the college library such of his books as the authorities may choose; to the university the balance of his books; and to his friend, Professor G. Elliot Smith, M.D., F.R.S., all his manuscripts, with £500 for defraying the cost of their preparation and publication.

THE National Council for the Promotion of Race-renewal, which established the National Birthrate Commission, is organizing an International Congress for the Reaffirmation of the World's Moral Ideal to be held in London, October 15th to 22nd. The Congress will be opened at Caxton Hall, under the Presidency of the Bishop of Southwark, on Tuesday morning, October 15th. The afternoon session, presided over by Dr. Mary Scharlieb, will discuss marriage and parenthood and the relation of the sexes, the speakers including Dr. H. Crichton Miller, Mr. C. J. Bond, F.R.C.S., and Dr. J. W. Ballantyne. On Wednesday morning the subject for consideration will be the economic, social, and racial aspects of morality and the rise and fall of population, migration, etc., the speakers including Sir Arthur Newsholme, K.C.B., M.D., Dr. C. W. Saleeby, and Professor William Caldwell, D.Sc., of McGill University. All communications about the Congress should be addressed to the General Secretary, Sir James Marchant, K.B.E., LL.D., 60, Gower Street, London, W.C.1.

THE BRITISH ASSOCIATION MEETING AT HULL.

THE ninetieth annual meeting of the British Association for the Advancement of Science closed at Hull on Wednesday, September 13th. We published last week an abstract of Sir Charles Sherrington's presidential address and a brief note of some of the earlier proceedings in the Sections. On the afternoon of the opening day, September 6th, the General Committee passed a resolution inviting the Council to make an effort, in association with the British Medical Association and kindred bodies, to obtain from the railway companies a renewal of the concessions in regard to fares which were in force before the war. It is greatly to be hoped that joint action in this direction may be successful. In connexion with the Annual Meeting of the British Medical Association held at Glasgow this summer, application was made to the Railway Clearing House for a return to the former practice of issuing tickets at reduced rates to medical practitioners attending the meeting, but the Clearing House did not see its way to accede.

On September 8th a formal invitation to hold the 1924 meeting of the British Association in Toronto was conveyed by delegates from the University of Toronto, who announced that a grant of 50,000 dollars would be made towards the expenses of British men of science visiting Canada, and asked that the meeting should be held in the second week of September. The invitation was accepted unanimously and with enthusiasm.

THE WORK OF THE SECTIONS.

We have only space to mention here a few of the multifarious papers and discussions, mainly those in the Sections devoted to the biological sciences. An account of Professor Cathcart's presidential address in the Section of Physiology is given below. Dr. J. C. Irvine, Principal of the University of St. Andrews, in the earlier part of his presidential address in the Chemical Section, referred to the organization of chemical research, and noted with approval the increasing recognition of chemists during recent years, both by the State and by the public. Professor H. H. Dixon's address in the Section of Botany was entitled, "The transport of organic substances in plants"—a subject which, in his view, had been somewhat neglected by plant physiologists. Joint discussions were held by this Section and the Section of Chemistry on photosynthesis, and with the Section of Zoology on the present position of Darwinism.

A joint discussion by the Sections of Educational Science and Psychology on psycho-analysis in relation to the school took place on September 8th, with Sir Richard Gregory, editor of *Nature*, in the chair. The debate was opened by Dr. C. W. Kimmins, Chief Inspector of the Education Department of the London County Council. In the course of his remarks Dr. Kimmins maintained that the child who failed to respond to the normal methods of instruction was essentially a case for the psychologist, and he urged the establishment of a psychological clinic in every school district. Both Dr. H. Crichton Miller and Dr. R. G. Gordon, who followed, called attention to current misconceptions in regard to the method and purpose of psychological analysis. On the previous day Sir Richard Gregory had given his presidential address in the Section of Educational Science on "Educational and school science."

A joint discussion on vitamins by the Sections of Physiology and Agriculture took place on September 8th, with Lord Bledisloe in the chair. The opener, Professor J. C. Drummond, gave a general account of our present knowledge of accessory food substances. He reminded his hearers that vitamins are all produced by green plants, for the ultimate source of the copious vitamins in cod-liver oil is a special kind of marine diatoms. Remarking that cod-liver oil, weight for weight, is 250 times richer in vitamins than butter, he suggested that farmers might see what could be done by adding small quantities of cod-liver oil to the dietary of backward animals. Captain John Golding, in giving an estimation of the practical agricultural importance of vitamin A in the feeding of pigs, warned farmers against the purchase of concentrated foods alleged to contain vitamins, and insisted that fresh green food or cod-liver oil must be the means of giving vitamins. Dr. Atherton Seidell, of Washington, gave an account of further studies on the isolation of the anti-neuritic vitamins. A stable, semi-solid extract of highly active vitamin, obtained from fresh brewers' yeast, had, he said, been used for fractionation experiments, with silver nitrate and ammoniacal silver nitrate as precipitating agents. The distribution of the active vitamin in the several fractions was studied by means of feeding experiments on pigeons, and the activity and general character of the several precipitates determined.

The independent proceedings of the Section of Physiology included two interesting popular lectures—one on September 8th by Mr. Joseph Barcroft on the recent expedition to the Andes for the study of the physiology of high altitudes (several references to this expedition have appeared in these columns), and another on September 12th by Professor W. D. Halliburton entitled "Our bones and teeth." The papers by Professor W. Storm van Leeuwen of Leyden dealt with two more or less related topics. In his first paper, entitled "Experimental studies on hypersensitiveness," he showed that the action of drugs on isolated organs could be augmented by substances having no stimulating action of themselves. He concluded that hypersensitiveness to drugs was due to (*a*) lack of fixing power of blood for the drug; (*b*) augmentor action in allergic reactions. This he suggested might explain why the symptoms of hypersensitiveness to different drugs showed little differentiation. His second paper dealt with the cause and treatment of bronchial asthma, hay fever, and allied conditions. In these conditions he perceived an allergic disposition with certain definite characteristics: (*a*) the occurrence of skin reactions with several proteins, hypersensitiveness to one protein being exceptional; (*b*) "crise colloïdoclasique"; (*c*) the presence in blood extracts of a poison stimulating smooth musculature; (*d*) hypersensitiveness to tuberculin. In regard to treatment Professor van Leeuwen considers that specific treatment is often impossible. His procedure is to give tuberculin in low doses; to regulate the diet; and in addition to give specific treatment, either by peptone therapy according to Dr. Au'd's method or by vaccines. His results show 52 per cent. of cures and 38 per cent. of cases improved. On September 11th Dr. F. W. Edridge-Green read two papers—one on colour-vision theories in relation to colour blindness, and the other on the necessity for a standard of white; in the latter he argued that any record for physiological purposes ought to contain a reference to the source of white light, which should be used for purposes of comparison, and could be reproduced by another observer. On September 12th Dr. P. M. Tolmie discussed the cytology of the blood and the source, development, and function of some of the corpuscles; and Dr. J. H. Burn read a paper on the physiology of sweating, in which he suggested that the activity of the sweat glands, when stimulated by pilocarpine, depends on the local capillary tone, this tone being independent of the arterial tone in the limb and its maintenance depending, amongst other things, on the integrity of the sensory nerves.

In presiding over the Section of Psychology Dr. C. S. Myers filled the vacancy caused by the lamented death of Dr. W. H. R. Rivers, and his presidential address dealt with the influence of Dr. Rivers's work on the development of the study of psychology in Great Britain. The concluding sessions of this Section included papers on the acquisition of skill in reference to training in industry, by Professor T. H. Pear; on auto-suggestion and the will by Dr. William Brown; papers by Dr. F. C. Shrubsall and Dr. G. A. Auden on mental deficiency; a paper by Dr. R. G. Gordon on difficult and delinquent children; and a joint debate with the Section of Anthropology on mental characters and race. Two other Sections (Economic Science and Statistics and Agriculture) combined on September 12th to discuss the possibility of increasing the food supply of the nation. The early proceedings in the Section of Zoology related almost exclusively to marine biology and fishery research.

During the meeting two conferences of delegates of corresponding and other societies were held under the presidency of Mr. W. Whitaker, to discuss methods by which the advantages of co-operation by scientific societies with the British Association and among themselves may be extended and improved.

ADDRESS ON HUMAN EFFICIENCY.

Professor E. P. Cathcart, M.D., F.R.S., gave his presidential address in the Section of Physiology on Friday, September 8th. His subject was "The efficiency of man and the factors which influence it."

He said that the term "efficiency" had become a mere catchword, and practically it had come to mean, to the average man in the street, the mythical improvement which

was to be anticipated from some change in workshop or office organization—a bigger and better result at a smaller cost. The word had a very definite meaning in engineering science, and this meaning had been transferred from the inanimate machine to the living organism. In the case of the engine the problem was relatively simple, as the number of interfering factors was not great; but the solution of the problem in the case of the organism was beset with many difficulties, as the interfering factors were numerous and varied.

Factors Influencing Efficiency.

The design of the organism which had to stand the strain was not at fault. It was an organism which, in the language of the engineer, was abundantly supplied with factors of safety, and had an over-all high factor of safety. The body was not designed merely to perform the minimum amount of work or to stand the minimum strain; there was always a reserve. We had a circulatory system which was beautifully balanced to meet a strain, a system of vessels whose calibre could be increased or diminished so that the blood might be mobilized at the tissues of the organs which required it, and a heart which had the capacity, provided it was normal and healthy, of responding to work, whose rate might be trebled in a few seconds when oxygen had to be obtained and carbon dioxide got rid of. Not only could the amount of blood which was passed through the lungs during hard work be increased some five times, but the amount of oxygen taken in might rise ten times. At rest less than a third of the oxygen present in the blood was required, and even in the very hardest work the arterial blood was not depleted of its oxygen; it probably still contained more than a fourth. The actual effectors, the muscles, did not of themselves seem to have a very high factor of safety. The structures—bone and cartilage—to which they were attached, and which limited their action, and the amount of strain to which they could be exposed or subjected, had a very high factor of safety.

The efficiency of a man did not merely depend on the amount of work which could be performed by his muscles; the circulatory, respiratory, and nervous systems were of equal importance, and all were intimately related. The muscles had to receive an abundant supply of blood, not merely to bring nutriment, but to remove waste; there had to be an efficient exchange of gases in the lungs, the rate of the respiratory and cardiac movements had to be adapted to the work in hand through the co-ordinating agency of the central nervous system. Not only so, but if the man was to work with the minimum of waste energy there had to be proper co-ordination between the various groups of muscles. Turning to the consideration of the factors which influenced the efficiency, both in the mechanical and industrial sense, it was found that the main controlling factor was undoubtedly the condition known as fatigue. "Fatigue" was a word just as frequently used as "efficiency," and yet it was almost impossible to give an accurate definition of the term. Generally speaking it was to be regarded as the antithesis of efficiency.

Rate, Rhythm, and Rest.

The factors which played predominant parts in the attainment of maximum efficiency were the rate of the performance of work, the amount of rest taken or offered by the subject, the rhythm with which the work was performed, and the work habits developed by the worker. These were all intimately related, and usually merged into one another. Of those four factors probably most attention had been devoted to the rate of speed at which work was carried out, and the glorification of that much misused half-truth, "Time is money," was responsible for much false physiology. Benedict and he had found, working with a carefully calibrated bicycle ergometer, that there was a very close connexion between the speed at which work was done and mechanical efficiency. There was a very definite falling off with increased speed. They found, further, that if the amount of effective muscular work was kept constant the efficiency fell with an increase of speed.

The load had obviously a direct connexion with the speed at which the work was done, but it had also a relation to efficiency. Benedict and he found, for instance, that both the gross and net efficiencies, within the limits of their experiments, increased with the load. The probable explanation of that result was that, when light work was carried out, maintenance of physiological requirements which had to be covered formed a large proportion of the total energy output, a balance which was steadily altered as the amount of external effective work done increased. On the other hand, when the loads became excessive there was a definite falling off both in gross and net efficiencies.

Very closely allied with the rate of working was the rhythm with which the work was performed. Although they were not identical phenomena, they were so closely related that the habit of work might be considered along with rhythm. Once a rhythm, or the proper co-ordination in the play of a set of muscles in the performance of some definite act, was mastered, not only was the energy expenditure reduced by the exclusion of numerous extraneous muscular activities, but the ease of performing the specified act was enhanced. Willingly or unwillingly those who had to do much repetitive work—whether it were playing golf, a musical instrument, or working a machine—soon appreciated the fact, when they thought about it at all, that their best and easiest results were obtained under certain very definite conditions. To take a single example, the work of forward progression, or walking, was performed most easily when a person adopted his own gait; it was not a mere question of rate.

The rhythm of work was simply a general example of the formation of a conditioned reflex. The rhythm adopted, although it might suit the worker, was not of necessity a series of muscle movements which led to the least expenditure of energy. Most probably the rhythm selected was only in small part due to the worker's physical configuration; in greater part it was evolved in imitation of some more experienced or older worker. The average workman was not so much concerned with the diminution of the physiological cost in the performance of a given act as in the reduction of constant effort.

On measuring efficiency in terms of output, a definite rhythm of output was found during the course of the working day and of the working week. The fact that it took an appreciable time each day to work up the full power was shown distinctly in the daily output curve, which rose and then dropped sharply at the end of the work period; this type of curve was not peculiar to any one industry. The rise was almost certainly due to the "limbering up," and it was probable that the fall towards the end was largely due to voluntary slowing. The total weekly output curve, with the low Monday effect and the sharp fall on Saturday, resembled in general shape the daily output curve. Such curves seemed to demonstrate the absence of progressive fatigue from overwork, which would have been deduced had there been a sharp rise at the commencement of the week followed by a steady fall.

The third of the potent factors in the control of fatigue was rest. If work was done, rest was ultimately imperative. Rest not merely relaxed the muscle, allowing a more thorough and complete removal of the waste products and a more abundant supply of oxygen, but it removed the strain of attention. Rest was best obtained not by simple quiescence, but by change of posture or slow movement of another type. Little attention had been paid to the duration of the rest period in relation to the work done. As a general rule it might be said that in the majority of occupations, although the hours of labour were continuous, the actual spells of hard manual work were discontinuous, either due to the fact that certain operations were intermittent in their severity, that supplies of material were not constant, or that if those more or less natural conditions did not operate rests at irregular intervals were deliberately taken by the operative.

Relation of Food to Efficiency.

There were many other factors directly concerned with the efficient action of the organism, some directly influencing the internal economy of the body, others acting more indirectly on the organism from the environment. One was the state of the nutrition. An insufficient intake of food, or the consumption of poor or inadequate food, was one of the chief sources of general inefficiency. Our resistance to the effects of hard and continual work, just as to the effects of an infection, was largely controlled by our reserves. The capacity of the body to store reserve food material which would meet the daily demands for energy, and leave a surplus, was another of the vital factors of safety, capable of withstanding complete deprivation of food for comparatively long periods, but with a corresponding depression in its capacity to perform external work. Complete starvation was a state which was rare and did not affect the question. Chronic undernutrition was only too common—a condition which lowered efficiency, not merely in the actual performance of muscular work, but by inducing an increased susceptibility to disease. Evidence, much debated it was true, indicated that it was not only the quantity but the quality of the food consumed which played a part in the fitness of the individual to perform hard muscular work. All modern work seemed to point to the conclusion that if the calorie value of the food supplied was adequate the actual demand for protein was very small. It was very difficult, however, to believe that the far-reaching common belief in the efficacy of a high meat intake, despite the scientific evidence to the contrary, was without some foundation.

The Psychological Factor.

Another factor which played an enormous part in the general efficiency was the response of the organism to the multiple psychic imponderabilia which composed such a

large part of the average environment. We had to deal with an organism which was not only under physical control, but which was very responsive to psychic influences—an organism which not only became in the course of the day physically "tired" but which unconsciously was influenced to an enormous extent by its environment, by its "atmosphere." In this connexion monotony of work had to be considered, yet, although there might be a close relationship between monotony and fatigue, they were not identical. The temperament of the operative played an enormous part in the determining of whether or not any particular operation was a monotonous one.

Many other factors played a definite and important part in the maintenance of efficiency, such as lighting, heating, ventilation, the mode of life led by the worker outside his definite hours of labour, his housing, etc. In other words, the real "over-all" industrial efficiency of the worker could not be causally related to any single factor. The quest of efficiency was one of the most intricate problems, in its infinite ramifications throughout the physiological and sociological structure, which had ever called for solution. It called for the closest co-operation between the scientific investigator, the employer, and the employee, and was no more capable of being settled on a communistic than on a capitalistic basis. It could only be satisfactorily attacked when mutual distrust of motives, capacities, and methods was stilled.

Nova et Vetera.

STYLE.

IN speaking of Sydenham a short time ago (August 19th, p. 320) we ventured to say that his Latin was very unattractive, and we are tempted to return to the subject by the hope that we may stimulate better scholars to discuss the ingredients of a good modern Latin style. Generally speaking, Macaulay's advice, "Soak your mind with Cicero," has been given by the professional scholars. Marc-Antoine Muret has been called the prince of modern latinists; Wyttenbach said, "If I have attained any little skill in writing, I owe most of it to reading Muret's works; his wonderful smoothness charmed me as a boy, helped me with examples, and led me back to Cicero."[1]

Sydenham, or his translator, went back to Cicero, but, as Dr. Payne showed, hardly found there what he wanted. For instance, in what was perhaps his first draft, Sydenham, having said that diseases differ from year to year, has this plain sentence: "Both which doe evince that they are of quite different genius and nature."[2] The Latin version runs: "Ex quibus constat morbos hosce utut quadantenus specie et symptomatis alienae admodum esse indolis et distere ut aera lupinis." The last phrase, as Dr. Payne said, is just the sort of tag with which a phrase-maker might swell out a plain sentence. Perhaps one may quote Erasmus: "Si revivisceret ipse Cicero, rideret hoc Ciceronianorum genus." We should very much like to know whether a good scholar would rate Sydenham high or low as a stylist.

Some medical latinists who had a great reputation have used a much simpler style. Of such was Josse van Lomm, often called the "elegant Lommius," whose style was praised by Haeser. Lomm is much easier to read than Sydenham; here is a fair specimen of his manner: "Neque enim parvi referre arbitror, quae cujusque morbi vis, aut acumen, aut duratio, aut eventus sit, observare; aeque profecto, ut in aliquem aliquis verti morbus possit, quibus aetatibus magis accidere, quibus temporibus anni, quibus coeli tempestatibus, quibus locis."[3] Easy, straightforward, not too stately, but with a touch of verbal pomp; certainly not Ciceronian in the sense that Sydenham's published writings are Ciceronian.

Perhaps it was Lomm's style which kept him abreast of Sydenham as a popular author for so many years. Lomm had been physician to Philip II of Spain, and was dead before Sydenham was born, but between 1700 and 1750 Lomm's *Medical Observations* were reprinted eight times; the great Englishman's works only had four more editions than his in the same time. Probably our ancestors, for all their stateliness, liked things made clear, and Lomm made them very clear.

Very likely some people who, at the cost of many tears and some blood (*teste* Gibbon), were just able to read plain Latin wanted to know what *synochus* meant; how a continued fever differed from a putrid continued fever; what a "slow fever" really was; and how to unravel the tangled skein of quotidians, tertians, semitertians, quartans, and so on.

Such readers must have been delighted with the elegant Lommius; having read him once they would know all about it. They would know that a *febris continens* was merely due to heated blood, that a *febris continens putrida* was due to putrefaction of blood and nothing else, while a *febris continua putrida* was bred of a systematic humoral corruption and different from a *febris lenta*, a more localized humoral putrefaction. Better still, the terrible complexities of the intermittents—a college "viva" on Galen *de Febrium Differentiis* must have been an awful ordeal—are reduced to their lowest arithmetical terms.

Lomm deserved and received the gratitude due to anyone who writes quite plainly, says what he has to say, without quoting needless Latin if he writes English, and without dropping into poetry if he is writing Latin. His style, of course, could not save him for all time, because, like another forgotten writer (Lord Jeffrey, described by Matthew Arnold), he "had no gift for truth." The prognostic significance of the Hippocratic facies is described neither more clearly nor less clearly than the prognostic significance of dreams. No doubt is hinted as to whether dreaming of a fire is a really sound indication that the yellow bile is amiss or as to whether a topographical diagnosis can be founded on a dream of sun, moon, or stars. Sooner or later someone was bound to discover that the prognostics from dreams were not derived from the elegant Lomm's observations upon King Philip, but lifted from the fourth book *de Victu* in the Hippocratic collection (Galen has most of them in his little tract, but he shied at the sun, moon, and stars). That discovery made, a reader would begin to doubt even about the synochus and the intermittents, and that would be the end of the elegant Lomm and his kind. Sydenham certainly said some very queer things about the use of nasty-smelling drugs in hysteria and had a weakness for puppies as hot-water bottles, but he had nothing to do with dreams. Perhaps we ought not to laugh either at Lomm or at the fourth book *de Victu*, because some learned American may yet prove them to be allegorical foreshadowings of a doctrine which we do *not* mean to discuss.

We suppose Lomm will never be reprinted again, but a selection of the writings of physicians eminent for their latinity would really be worth making. It would begin, we suppose, with the greatest of all the stylists who, using his mother tongue, said this: "A suturis se deceptum esse, Hippocrates memoriae prodidit; more scilicet magnorum virorum, et fiduciam magnarum rerum habentium. Nam levia ingenia, quia nihil habent, nihil sibi detrahunt; magno ingenio, multaque nihilominus habituro, convenit etiam simplex veri erroris confessio; praecipueque in eo ministerio, quod utilitatis causa posteris traditur; ne qui decipiantur eadem ratione, qua quis ante deceptus est."

To soak one's mind with Celsus might be better advice than to imitate Cicero.

MINISTRY OF HEALTH: ANNUAL REPORT.

SECOND NOTICE.

IN the JOURNAL of July 29th (p. 184) we gave a brief account of the parts of this report relating to tuberculosis, venereal diseases, maternity and child welfare, welfare of the blind, and the work of the Welsh Board of Health. Two further matters of medical interest and importance remain to be noticed—Housing and National Health Insurance.

Housing is dealt with at some length in the report. The problem, it is stated, entered on a new phase in the year 1921–22. Difficulties due to shortage of capital, labour, and materials, and to the inauguration of a comprehensive policy, had tended to diminish, but on the other hand the cost of building had become so high as to render imperative the limitation of the amount to be undertaken at the expense of the Exchequer, and it was hoped that such limitation would help towards deflation of prices, so as to pave the way for the resumption of private enterprise. It is claimed that the policy has been successful, as proved by reductions of tenders from £944 and £855 to £450 and £378, with anticipation of further decreases. But the urgency of improvements in slum areas was such that an annual contribution not exceeding £200,000 was determined on in aid of this part of the work of local authorities. The houses completed under various schemes at March 21st,

[1] See preface to M. Antonii Mureti, *Scripta Selecta*. Leipzig (Teubner), 1887.
[2] *The Life of Sydenham*. By J. F. Payne, London, 1900, p. 219.
[3] Iodoci Lommii, *Observ. Med.*, 4th ed., Amsterdam, 1738, p. 281.

1922, were 130,335, and of these completions fully 100,000 belonged to the year under review. There still remained 75,484 to be erected under the final scheme by local authorities and public utility societies, and of these 52,417 had already been commenced. Besides this, preliminary certificates had been issued in respect of 12,295 to be erected by private builders. Recent reductions of price, however, did not greatly diminish obligations already undertaken, and the subsidies paid during the year amounted to £4,533,229. As to rents, agreement had been reached with about 1,100 local authorities, and the range, exclusive of rates, was from 4s. 6d. weekly for a four-roomed house in a rural area to £1 1s. weekly for a six-roomed house in a popular residential locality in the metropolitan area. The loans raised by local authorities under the State-aided schemes amounted to £152,000,000 at the end of March, 1922.

Under the Public Health Acts and the Housing Act of 1890 reports by medical officers of health in 1,503 districts show over a million inspections and remedy of defects in 180,699 houses. Under the Act of 1919 notices were served in respect of over 30,000 houses, of which nearly 20,000 were rendered fit by their owners, 801 by local authorities, and 425 were to be closed. Under the Public Health Acts notices were served for more than a quarter of a million houses, and defects were remedied in over 220,000, including nearly 2,000 done by local authorities instead of by the owners. Town-planning schemes were occupying the attention of 167 local authorities at the end of the year, and the total area embraced was 744,222 acres.

National Health Insurance.

Up to October, 1921, Insurance Committees had forty to eighty members; now they have twenty to forty. Questions relating to the scope of medical benefit ("such treatment as" can "be properly undertaken by a general practitioner of ordinary professional competence and skill") were in thirty-one cases reported to the department. Of twenty-two, where the local Medical and Insurance Committees were agreed, seventeen were decided to be outside the definition and five within it. Of the other nine cases, six came before referees; four of them were declared to be within and two not within the definition. In three cases sent to referees by the Ministry itself, one was found within the definition and two were not. Medical benefit in England cost about £8,250,000, of which about £6,885,000 was paid to the doctors and the remainder nearly wholly spent on drugs and appliances. The insured population is about 12,500,000. Besides the above expenditure about £250,000 was distributed to rural practitioners for mileage. Drugs and appliances cost about £1,250,000. The payment made to chemists, apart from the price of ingredients, was about 5½d. a prescription, but was reduced to 4½d. as from May 1st, 1922. It is pointed out that "no insurance practitioner can be penalized in any way as a result of his prescribing particular drugs or appliances" unless it is found, after inquiry by the Panel Committee, consisting entirely of the doctor's fellow practitioners, that "the cost is in excess of what may reasonably be necessary for the adequate treatment" of the patient. Also it is pointed out that "this duty has been entrusted to the practitioners themselves at the request of their own representatives, who have undertaken that the work should be fairly performed."

During the year, on account of unsatisfactory standard of service, Exchequer grant to the total amount of £1,118 was withheld from seventy doctors and six chemists. In four cases of doctors £50 was withheld, and in two cases £40. "In four of these cases the doctor was found to have been guilty of serious neglect of patients. In one case the doctor permitted his wife to attend patients, though she held no medical qualifications, and in another the doctor persistently charged the patient fees for services which he was under contract to render free of charge." From one chemist £50 was withheld in respect that he "repeatedly supplied smaller quantities of drugs and appliances than those ordered by the doctor."

Fourteen inquiries were held as to removal of practitioners or pharmacists from the medical list on the ground that their continuance would be prejudicial to the medical service. Eleven related to doctors, three to pharmacists. Three of the doctors had been convicted of criminal offences; two of these were removed from the list, and in the other a decision was deferred for twelve months, regard being had to the doctor's conduct in the meantime. In two cases the complaint was neglect of patients. One of the practitioners died and the other was allowed to resign on condition that he would not resume insurance practice without the Minister's consent. In three cases the representations were withdrawn, and one case was dealt with by the General Medical Council. In the three remaining cases the grounds alleged were insufficient to justify an inquiry. Two pharmacists were removed from the list and the third had £50 deducted, besides having to pay the costs of the inquiry.

Against decisions of Insurance Committees there were sixteen appeals, eleven by doctors and five by insured persons or societies. Of the eleven, six were dismissed, four allowed, and one withdrawn. Of the other appeals, one decision was varied, one was dismissed, and in two no sufficient grounds of appeal were shown. In ten cases the doctor appealed against a decision of the Insurance Committee to withhold part of his remuneration on the ground of excessive or extravagant prescribing. Two of the appeals were dismissed (the Insurance Committee in one case agreeing to reduce the penalty), one appeal was allowed, one withdrawn, and in the rest the amount of surcharge was reduced.

New certification rules took effect from January 1st and certain amendments were made in the scheme. The new forms of record have been found generally acceptable to practitioners. The Committee on National Expenditure recommended that to relieve the Exchequer of payments beyond its statutory two ninths there should be an increase in weekly contributions, but the approved societies preferred to pay the requisite amounts out of their surpluses and balances. This was agreed to up to the end of 1923. The Women's Equalization Fund was abolished and the necessary financial assistance to societies will be provided by increasing the reserve values in respect of married women, the period of redemption being extended by between one and two years.

Schemes of additional benefits, made available by the societies' surpluses shown in the valuation reports, came into operation on July 4th, 1921. The benefits selected by the societies are of two sorts—cash, or forms of remedial treatment. Societies with a membership of 3,896,258 decided on cash benefit only; others, with a membership of 4,392,461, decided in favour of a combination of cash and other benefits; and societies with a membership of 4,112,298 decided to devote their whole available surplus to other than cash benefits. In the first of the three groups the cash increase ranges normally from 1s. to 5s. a week of sickness benefit; 6d. to 2s. 6d. a week of disablement benefit; and 2s. to 10s. of maternity benefit. Thus the total weekly sickness benefit may vary from 16s. to 20s. for men and from 13s. to 17s. for women; disablement benefit from 8s. to 10s. weekly; and maternity benefit from 42s. to 50s.

THE FATAL CASES OF FOOD POISONING AT LOCH MAREE.

[FROM A CORRESPONDENT.]

THE outbreak of food poisoning at Loch Maree has been referred to recently in the BRITISH MEDICAL JOURNAL on several occasions, and the last may not have been heard of outbreaks of botulism in this country. The sheriff's inquiry was held on September 5th, 6th, and 7th at Dingwall, under the Fatal Accidents Inquiry Act; in this he had the assistance of a jury of seven, four of whom were women. The jury attributed the cause of death of eight persons (which included all those who were attacked) to poisoning by eating sandwiches that contained canned wild-duck paste infected by *Bacillus botulinus*, an anaerobic organism. The jury found that there had been no negligence on the part of anyone concerned, including both the manufacturers of the paste, who were a London firm of high standing, and the hotel proprietor, and that it was not possible to specify what precautions should be taken in future in order to avoid the occurrence of a similar accident. A rider was added to the effect that every vessel containing preserved meat, fish, fruit, or vegetables intended for human consumption should bear a distinctive mark by which, if necessary, details of manufacture might be traced.

Thus the inquiry ended very much in the way which might have been anticipated, no blame being attributed to anyone. But the epidemiologist in the result emerges, unfortunately, little wiser. The main point of interest, epidemiologically, arising from the investigation is that Great Britain is no longer immune from outbreaks of botulism. It may be suggested, judging from foreign experiences, where the articles of food incriminated ranged from sausage and ham

on the one hand to canned beans and olives on the other, that the next outbreak in this country is not more likely to be associated with potted food paste than with many other foodstuffs. This attitude, unfortunately, is necessitated by our lack of knowledge as to how these outbreaks arise. It is known from laboratory tests that much more than a lethal dose of *B. botulinus* or its toxins may be administered to an experimental animal, and if a suitable dose of botulinus antitoxin be administered simultaneously or thereabouts illness is not produced. We do not know, however, whether this antitoxin would be of value in saving life if it were administered to a human case as soon as a diagnosis of botulism were made.

A very striking feature in the diagnosis of botulism is recognition of the phenomenon of double vision some hours before any other subjective symptoms are noticeable. The patient at this stage apparently may be in normal health, apart from the presence of diplopia. An American citizen visiting this country was present some three years ago at a banquet in the State of Ohio which was followed by an outbreak of fatal botulism due to bottled olives from California. He states that in one instance diplopia suddenly manifested itself when the victim was driving a motor car; another could not understand why two persons walking in the street were, as he thought, performing simultaneously identical antics; and another was puzzled by his inability to remove from a plate one of the two peaches seen by him. Up to this point these persons appeared otherwise to be in good health. Similar instances of diplopia were reported from Loch Maree; one of the victims, for instance, was struck by the fact that a companion was smoking two pipes, and indeed there appears to be no difference whatever between the clinical accounts of botulism in the United States and the Loch Maree experience.

Treatment is most unsatisfactory. The main hope would appear to lie in the use of the specific antitoxin. It is available as a result of work done in the Wellcome Research Laboratories* in connexion with the prevention and cure of "grass sickness" or "grass disease" in horses, which is ascribed to botulism. It was announced at the inquiry that arrangements were being made for a supply of this antitoxin to be obtained, in case of necessity, by application to the Ministry of Health, and that the serum would be placed at a number of suitable provincial points; Plymouth, Cardiff, Birmingham, Manchester, and Newcastle-upon-Tyne were mentioned, and the Scottish Board of Health was to take similar steps for Scotland. Other centres, such as Norwich and Chester, might perhaps be included also. In view of the urgent need for commencing intravenous injection of this serum, amounting eventually to about 50 c.cm., as soon as the diagnosis is established, in order to overtake if possible the effects of the toxin, the prospects of a sufferer at, say, Carlisle or Newcastle would be much prejudiced if recourse had to be made to London, as he would be fortunate in the circumstance if he received his first injection within twelve hours of the need for its administration being realized. In view of the Loch Maree outbreak the subject of "grass sickness" or "grass disease" in horses deserves close attention. This "grass disease" has been known in the north (and more recently in the south) of England and in Scotland now for some years; a specially appointed Science Committee of the Highland and Agricultural Society of Scotland was appointed to investigate it in 1918. The symptoms are identical with "forage poisoning" in horses and cattle in the United States of America, and the disease has been found to be due to an organism reported to be indistinguishable from *B. botulinus*. This organism was recovered early in 1919 by Dr. Tocher of Aberdeen from the intestines and spleen in several cases of "grass sickness" in horses. At the Loch Maree inquiry little was said as to the possibility that this outbreak of poisoning in man was associated with this particular disease in horses. If, however, there is an association between attacks of botulism in man and "grass sickness" in horses—and, as is known, this disease in horses is widely disseminated in Great Britain—it would be hazardous to prophesy what is likely to happen in the future.

Some positive evidence is available which is reassuring. *B. botulinus* can live only under anaerobic conditions, and it and its toxins are killed at a temperature much below that reached by the ordinary method of canning. The spores are, however, more resistant, for they are not killed until a temperature considerably above boiling point is reached and maintained; but this temperature is attained during the process of sterilization under pressure in retorts as usually practised in food-canning factories. Why one individual vessel containing food paste contained this deadly bacillus is as yet unexplained. Obviously, the bulk of the paste as prepared and mixed on a large scale in the factory could not have been infected, as all this stock has in the ordinary process of trade been put into circulation; most of it must have been consumed, and no adverse results have been reported. No doubt the consumption of canned goods in this country will fall off for a time; but it is comforting to remember that in spite of the many million containers of preserved foodstuffs, including food pastes, supplied to the armies during the recent war, whether issued to troops as rations or sold in enormous quantities in canteens, no outbreak of botulism was reported in connexion with their consumption, either at home or abroad.

*Grass Disease and Botulism. By J. B. Buxton, F.R.C.V.S., D.V.H. *Veterinary Journal*, April, 1922.

Scotland.

REPORT OF THE MEDICAL OFFICER OF HEALTH FOR GLASGOW FOR 1921.

THE annual health report of the Second City of the Empire is a foolscap volume of 175 pages and deals with many matters of public interest. Population, housing, and occupations have already been referred to in the JOURNAL in articles on the census (August 26th, p. 399) and on the Registrar-General's Annual Report for 1920 (July 29th, p. 178). In 1921 a new minimum death rate of 14.5 on the estimated population of Glasgow has been achieved, and also a new minimum infant mortality rate of 105 per 1,000 births. These figures have to be judged in relation, not to certain lower rates elsewhere, but to the housing and other conditions of life in Glasgow itself.

As regards housing, Dr. Chalmers calls attention to its moral aspects, a subject which, under the title of *Life in One Room*, called forth one of the most eloquent and pathetic contributions ever made to the literature of public health, the author being the late Dr. J. B. Russell, the predecessor of Dr. Chalmers in his important office. Under the heading "Sex overcrowding in small houses," Dr. Chalmers gives some appalling examples.

"In a one-apartment house, a father of 52 occupied the same bed with a mentally defective daughter of 24, who had an illegitimate child of 10. In another, with space for five adults, a father and daughter shared the same bed. In another, with space for two and a half, a mother occupied the same bed with two sons of 19 and 20 years respectively. Several illustrations of this were disclosed, as were also illustrations of fathers and daughters. In several illustrations the mothers occupied the same beds with grown-up sons and daughters."

In two-roomed houses, in one instance a son of 19 and a daughter of 21 occupied the same bed, and in another a son of 19 and a daughter of 25, who was pregnant. These are revolting facts, but it is right that the public should be made aware of them. As regards available housing accommodation, which a reader naturally thinks of in connexion with such revelations, there appears to be a curious discrepancy between the data furnished by the City Assessor of Glasgow and the Census Report. According to the former, whilst there were in 1911 24,206 empty houses, there were only 143 in 1921. But, as pointed out in a footnote by Dr. Chalmers, the new Census Report gives the "unoccupied" houses in Glasgow as 11,539. The difference is much too great to be accidental. The assessor's word "empty" cannot mean the same thing as the Registrar-General's word "unoccupied," and the reader may speculate that the unoccupied houses were those temporarily closed owing to households being on holiday in June when the census was taken, this agreeing with Dr. Chalmers's contention that the population was unavoidably understated. The report, however, contains a table in which the two words "empty" and "unoccupied" seem to be regarded as interchangeable, and which shows that the unoccupied or empty houses, now only 143, had been in 1913 no less than 18,710.

Maternity and Child Welfare.

With the co-operation of an advisory committee, classes on cookery and dressmaking have been begun, and social evenings arranged for.

Infant consultations are conducted at thirteen centres, and the total attendances in 1921 were 61,621, as against 44,237 in 1920. Of infants under 1 year the attendances were primary 7,811, and subsequent 40,434; of children over 1 year, 3,187 primary, and 10,189

subsequent. At the ante-natal dispensary at the Royal Maternity Hospital there were 6,034 attendances, against 3,151 in 1920. In the ante-natal wards the average number under treatment was 28, the number of admissions 703, and the total days 10,318—all considerable increases over previous years. At another institution, the Govan Nurses' Home, there were 771 attendances. Infant visitation is carried on extensively where birth notifications do not show that a doctor was in attendance. Full information was obtained regarding 22,216 births; 18,768 infants were reported well nourished at birth, 1,518 fairly nourished, 801 badly nourished, and 816 stillborn. The Infant Health Visitors' Association keeps under observation children reported to it as requiring longer observation than can be given officially. There are from 300 to 400 visitors, and the period covered is generally the first year of life. In 1919 the number of infants so dealt with was 2,179. The Corporation administers seven day nurseries, and the total attendances during 1921 were over 32,000. Two country homes received 182 children.

Supply of Milk and Meals.

Much detailed statistical and financial information is given on this subject, in which the Corporation co-operated with the education authority, these being separate public bodies in Scotland. The times were exceptional in respect both of high prices and of poverty. It has to be borne in mind that in Scotland the Poor Law authorities can, in theory, give relief only to persons who are not only in poverty but also unfit to work. In practice, however, that rule had to be relaxed, but, even so, a heavy burden fell on the public health and education authorities. The risks of overlapping and also of lacunae in any such tripartite system of rate and State aided relief are obvious, and bring to mind the recommendation of the Minority Report of the Royal Commission on the Poor Law, supported as it was by their medical investigator for England and Wales, that public health and Poor Law should be administered by one and the same local body. In such work the definition of "necessitous" as a basis for relief must always be difficult, stringency and laxity each having dangers of its own, the effects of the latter being illustrated in the present revolt against "Poplarism" in London. Glasgow Corporation has its "right" and "left" parties, and no doubt the usual clash of opinions took place, but such matters are not within the scope of the medical officer's report. In December, 1920, the local authority and the Scottish Board of Health approved of a scheme which came into operation in January, 1921.

The growth in the demand for milk for expectant and nursing mothers is indicated by the fact that between February 5th and December 23rd, 1921, the number of mothers obtaining milk under the Glasgow scheme, apart from the Poor Law, increased from 192 to 5,151, of children under 5 years from 58 to 13,234, of pints of milk from 826 to 18,385 a day, whilst the daily cost grew from £18 to £275. As to meals, distress reached its climax on the occurrence of the coal strike in April, and at the beginning of May a scheme of dinners was begun for mothers and children, which by the end of the year had provided 952,608 meals, of which 409,001 were for mothers, 309,971 for children of 3 to 5 years, and 233,633 for infants from 9 months to 3 years.

Details are given of the economic conditions relating to family, employment, and income, which were considered in the granting of assistance; in an appendix there are tables of income and occupation which may furnish material for students of sociology.

Ophthalmia Neonatorum.

In 1921, 926 cases were notified as against 787 in the previous year, but this is explained partly by increase of births and partly by the influence of a circular issued by the Scottish Board of Health in July regarding precautions to be observed, especially the application to the eyes of newborn children of a 1 per cent. solution of silver nitrate. This has resulted in more care being taken, and more slight inflammations being notified.

By doctors 97 cases were notified, by institutions 60, by institution nurses 198, and by midwives, etc., 566. The periods at which symptoms appeared were: under twelve hours, 102; twelve hours to four days, 423; four to eight days, 257; and over eight days, 134. The results of treatment are tabulated in detail; 745 were entirely cured, and no case of total blindness occurred. Mothers were offered treatment for the venereal disease which caused the ophthalmia in their offspring, but few continued under it until cured. Of 30,072 births during the year, 15,212 were attended by midwives, and of these 12,000 occurred in the practice of midwives with fifty confinements or more in the year. The number of midwives in practice was 364. They notified 418 cases of ophthalmia neonatorum and 112 of puerperal fever. In Glasgow in 1921 there were 10.8 cases of puerperal fever per 1,000 births, as against 9 in 1920 and 7 in 1919. The increase, Dr. Chalmers remarks, may be partly due to notification of short-lived rise of temperature.

Principal Zymotic Diseases.

If the term be applied throughout in the same sense these diseases have had a lower total mortality in 1921 than in any previous year, the rate being only 1.116 per 1,000 living, as against 3.600 in the decade 1881–90, 3.282 in the next decade, 2.660 in 1901–5, 2.450 in 1906–10. In the past six years the rate has exceeded 2 per 1,000 only in 1917.

Small-pox, of which there were 477 notifications in 1920, had only 19 (or 20?) in 1921. Diphtheria has a curious case mortality rate in respect that in 1920 and 1921 the fatality rates of cases treated at home (15.5 and 13.8 per cent.) were just about the double of the hospital case rates (7.6 and 6.6); whilst in 1919 the position was just the opposite, the home fatality rate being 4.4 per cent. against 9.1 in hospital. But only 5 to 10 per cent. of all cases were treated at home, and as the annual totals averaged about 1,800 the 5 to 10 per cent. afforded no great basis for fatality rate conclusions.

Concerning erysipelas and perhaps also puerperal fever, Dr. Chalmers seems to suspect that relaxation of restrictions on sale of liquor has tended to increase the numbers, as compared with war years. Malaria and dysentery were treated at three dispensaries, and the total attendances were 7,154. Dr. Chalmers reprints from the *Glasgow Medical Journal* a report by Drs. Macgregor and Frew on the treatment of amoebic dysentery by alcresta and emetine. Diarrhoea and enteritis caused an excessive number of deaths among children, no doubt owing to drought and heat, so it is all the more satisfactory that, as already noted, the year's infant mortality rate was the lowest on record. Phthisis had a death rate of 1.007 per 1,000, also its lowest on record. In 1881–90 the rate was 2.680, in the next decade 2.015, in the next 1.533. In each of the last three years the rate has been under 1.1. In the years 1914–20 inclusive, Edinburgh, Aberdeen, Dundee, and Birmingham had lower rates, whilst Liverpool and Manchester had higher. The Glasgow notifications also were low in 1921.

Omissions to notify before death occurred in 3.6 per cent. of the cases. The number of cases treated in institutions has just about doubled since 1914, the total that year having been 1,690, and in 1921 3,287. At dispensaries primary attendances were 2,542, and subsequent attendances 57,825. Home visits by nurses numbered 40,161, being a large diminution on the two previous years. A fund of about £400 a year has been established to provide warm clothing for poor patients going to sanatoriums, and has met a real want. Intimations of non-pulmonary tuberculosis show some diminution since notification became compulsory on July 1st, 1914. Admissions of such cases to institutions have increased from 17 in 1915 to 1,019 in 1921.

Venereal Diseases.

Much detail is given of accommodation and provision for treatment of these diseases. Dr. Chalmers believes that opinion is gradually crystallizing round the need for some modified form of notification—perhaps, to begin with, the notification of cases where third parties suffer, as in congenital syphilis and ophthalmia neonatorum. As to medical education on the subject of venereal disease, Dr. Chalmers thinks it should be improved, the successful treatment of gonorrhoea demanding skill and knowledge of instrumentation obtainable only by devoting to it considerable time. Syphilis treatment is more easily learned. It is unfortunate, he says, that more practitioners do not avail themselves of the facilities for post-graduate teaching of the subject in Glasgow, and that only 12 out of about 500 practitioners in Glasgow have during the year taken advantage of the free supplies of salvarsan available.

Port Sanitary Administration.

Glasgow is the port authority, not only for its own area, but for parts of the Clyde lower down. A detailed report is given of work done under the regulations of the Scottish Board of Health, and as to disembarking quays, boarding by Customs officers, work under the Aliens Order, and boarding and removal of the sick.

Vessels arriving from foreign ports numbered 1,242, of which 421 had come from ports infected within the meaning of the Cholera Order. The total crews in the course of the year were 66,968, and passengers 12,891. During the voyages 128 cases of infectious disease occurred, of which 47 were dealt with at other ports and 81 on arrival, 46 being removed to hospital and 35 sent home. Six died during the voyage. Alien passengers numbered 3,490, of whom 505 were transmigrant. For discovery of nuisances 2,108 inspections of vessels were made, and 1,195 nuisances found. Of foodstuffs from abroad 715,075 tons were imported, and 1,635 tons were found unfit and disposed of to the satisfaction of the medical officer of health. The total packages of foreign meat imported were much fewer than in 1919 and 1920. A leaflet under the Rats and Mice (Destruction) Act, 1919, was given to all masters on arrival at the port. About 2,700 rats were destroyed.

Bacteriology.

Dr. R. M. Buchanan reports on the work done in the Public Health Laboratory regarding diphtheria, enteric fever, tuberculosis, Vincent's angina, malaria, dysentery, ophthalmia neonatorum, milk supply, and rats examined for plague. In

a considerable number of less severe cases of ophthalmia neonatorum the gonococcus was not found, but staphylococci, streptococci, pneumococci, Koch-Weeks bacillus, and the Morax-Axenfeld bacillus. Since notification of ophthalmia neonatorum was made compulsory 7,873 examinations have been made at the laboratory, with positive results in 41 per cent., and the notification has been of much value for ensuring early diagnosis and treatment of one of the most preventable of infectious diseases.

Operations under the Food and Drugs Acts and Dairies Orders, and for smoke abatement, are reported. The divisional sanitary inspectors report the general sanitary operations in their own areas.

INCORPORATED SANITARY ASSOCIATION OF SCOTLAND.

The forty-eighth annual meeting of the Incorporated Sanitary Association of Scotland was held at Rothesay on September 6th, 7th, and 8th. The popular lecture was given by Professor J. Graham Kerr, of the Zoological Department of Glasgow University, and had as its subject "Zoology and sanitary science." Amongst other topics he considered the production of light in animal bodies. In the human subject there was no lighting system, but in many other organisms there was, and in some of these as much as 96 per cent. of energy was given off as light; Nature had solved the problem of the production of "cold" light. Civilization had extorted a large price from the human race in connexion with microbes; the human body was accustomed to certain microbes, and was little hurt by them, but civilization led man to tropical countries where he met other microbes and suffered heavily from them, as was seen in connexion with malaria; he also took some of his diseases with him to which the natives of the tropics were not immune, and they in their turn had to suffer. The lecturer paid a tribute to the good work being done in the Marine Biological Station at Millport; a visit to this station was paid by members of the Congress on Saturday, the 9th. On September 7th Mr. Thomas Bishop, Deputy Chief Sanitary Inspector (Edinburgh), gave the presidential address, and dealt with "Certain urgent sanitary problems," including the fighting of tuberculosis by improved housing and the elimination of the tuberculous cow. Lieut.-Colonel T. Dunlop Young, Chief Meat Inspector (London), dealt with the "Handling, storage, and transit of food," and urged that all food animals should be examined as far as possible *ante mortem*, and that all should be examined *post mortem*. In the discussion Dr. Walter F. Brown (Ayr) emphasized the need for financial encouragement of research work, and used the Loch Maree food-poisoning tragedy as an argument. On September 8th the main subject discussed at the Congress was the treatment of the venereal diseases. Dr. T. F. Dewar (Edinburgh) of the Scottish Board of Health, Dr. H. C. Donald (Paisley), Dr. David Lees (Edinburgh), and Dr. W. G. Clark (Glasgow) all spoke of the difficulties in the way of carrying out effective treatment up to full cure of the diseases, and a resolution proposed by Dr. McGregor Robertson was carried, and was to the following effect:

> That the Council of the Association be recommended to represent to the Scottish Board of Health, by deputation or otherwise, the need of an advance in the administrative control of venereal diseases by some form of notification and of research in connexion with the diseases, and that the Council should associate itself with any other body seeking the same end.

SCOTTISH ASYLUMS' PATHOLOGICAL SCHEME: DEMENTIA PRAECOX.

The twenty-sixth annual report of the Board of the Scottish Asylums' Pathological Scheme, signed by the Chairman (Dr. James H. Skeen) and the Honorary Secretary and Treasurer (Dr. Robert B. Campbell), deals with the work done in 1921. In addition to the routine work of examining and reporting on asylum cases and of preparing vaccines, Dr. Ford Robertson has continued his researches into the causation and treatment of dementia praecox and has emphasized the importance of investigating the early cases. He also lays great stress upon the fact that cases of early dementia praecox suffer from extremely severe chronic bacterial infections of known neurotoxic character, involving chiefly the intestinal tract. Although the part which these infections play in causation requires definition there is evidence that their suppression benefits the patient. Dr. Robertson is careful to point out that eradication of a chronic infection does not necessarily follow its detection; further, he admits that chronic infection in this malady is only one of several factors in its pathogenesis, such as those which are purely psychological, the effects of disorders of internal secretions, and the autointoxication dependent upon intestinal stasis. He regards the endocrine disturbances and the autointoxication as mainly due to intestinal neurotoxic infections; he looks hopefully to the suppression of these infections in an early stage of the disease by therapeutic immunization; and he can point to two successful cases in which these conditions were present and such treatment was given. The finances of the scheme have given rise to anxiety during the year; but through the aid of a grant from the National Research Council (in place of that from the Treasury withdrawn) the work has gone on.

HEALTH OF PAISLEY.

In his report for the years 1920 and 1921 Dr. G. V. T. McMichael, medical officer of health for Paisley, states that there were during 1920 2,505 births, giving a birth rate of 28.4, the highest recorded for many years; in 1921 there were 2,230 births, a rate of 26.3. In 1920 there were 1,124 deaths, or a rate of 12.8, which was the lowest ever recorded; during 1921 there were 1,127 deaths, a rate of 13.3, which was the lowest rate recorded with the exception of that of 1920. The infantile mortality rate for 1920 was 86 per 1,000 births, the lowest on record with the exception of the year 1918; in 1921 the rate was 94 per 1,000 births, which compares favourably with that of the other large towns in Scotland. Dr. McMichael points out that deaths due to respiratory diseases, as usual, contributed largely to the infantile mortality rate, and expresses the opinion that so long as the present deplorable housing conditions exist, so long will the death rate of children from respiratory diseases continue at its present high level. With reference to the small-pox hospital, Dr. McMichael suggests that it is quite absurd to have numerous small hospitals dotted about the country and specially reserved for small-pox; one central hospital, capable of rapid expansion if necessary, would be quite adequate for any county area or even for a combination of counties.

England and Wales.

THE CENSUS REPORTS.

IN a printed circular issued from Somerset House the Registrar-General gives an account of the form and contents of the 1921 Census Reports for England and Wales. These reports will be issued in "County Parts," each comprising, for a particular administrative county with its associated county boroughs, the whole of the census statistics which can suitably be presented in that form. When this series is completed certain "Subject Volumes" will be issued setting out for the country as a whole the statistics relating to those heads of subject-matter which are unsuitable for presentation in the County Parts. The question of rearranging the contents of the complete County Part series and republishing them in separate Subject Volumes for the whole country will be considered later in the light of any public demand for the presentation of the figures in that form. In any case, however, a summary volume will be published. The Registrar-General is empowered by the Census Act, 1920, to prepare and supply statistics not presented in the published reports at the request and cost of any local authority or person. Such requests for the special extraction or compilation of census material should be addressed to the Registrar-General, Somerset House, London, W.C.2, who will advise and give an estimate of the cost. In order to reduce expense early application should be made. The circular contains also an outline of the contents of the County Part series and of the Subject Volume series, showing under various headings the subject-matter of each table and the district for which it will be published.

ROYAL EARLSWOOD INSTITUTION.

The report of the Royal Earlswood Institution for Mental Defectives (Redhill, Surrey) states that the number of patients at the end of the year was 439; 47 cases were admitted during the year, 10 of whom were classed as idiot, 35 imbecile, and 2 feeble-minded; 7 were mongolian, 5 epileptic, and 1 each cretin, hydrocephalic, and paralysed. In regard to the causes assigned for the mental deficiency in these cases, 12 were due to heredity, 7 had a history of phthisis, 7 had a history of injury during birth, 6 of shock or indisposition of the mother, 4 had congenital or acquired

deafness, 2 had convulsions during infancy, 2 had acquired or congenital syphilis, 1 was the offspring of first cousins, and 16 had no cause assigned. Little stress can evidently be laid on the supposed cause of the condition. The medical superintendent states that one patient who suffered from *petit mal* previous to admission, and was taking thyroid extract, had no attacks after admission when the thyroid treatment was stopped. Twenty cases were discharged during the year—14 of them improved and 6 not improved; among those discharged improved were some who could quite well assist in their own maintenance while living amongst relatives or friends. During the year 19 cases died; the death rate to the total number under treatment for the year was 3.9 per cent.; 4 of the deaths were due to epilepsy, an abnormally high percentage for this disease, and 2 were due to tuberculosis, which was an exceptionally low number; influenza was the cause of 2 deaths, and the indirect cause of 2 others.

Correspondence.

CLAYDEN *v.* WOOD-HILL.

SIR,—The letter on page 403 of your issue of August 26th deals with several points of great professional importance which the case in question brought out, but there are others which for a long time I have felt should be brought to the notice of your readers, and perhaps the closing of the fund serves as a good occasion for addressing you.

If I read rightly the official account of the proceedings, which owing to your kindness I was privileged to have at my disposal, I think I am right in concluding that the verdict against the defendant may be attributable to two things, of which one was that the court found that the fracture in question was not treated in the correct position. Now, it may be thought that I labour the point, but as such a view is so often put forward in other trials, and as so much of the textbook teaching tends to propagate the same line of thought, I would like to urge in the strongest possible way that there is no one universal routine position in which any given fracture must be put up, and that while it may be a fairly average truism of practical use for students and for teaching purposes that certain positions are as a rule necessarily desirable for the treatment of particular fractures, such a view is not fortified by so large an amount of truth as to be of value in a court of law. In the case at issue it was apparently laid down and admitted by the various experts that the limb should have been put up in abduction. If this is admitted (personally I doubt if the experts for the defence ought to have admitted this, though, as far as I read the evidence, it showed that the limb was put up in abduction) it is obvious that there are various degrees of abduction, and I should most strongly maintain that in any series of any particular fracture the degrees of abduction necessary to secure alignment, which is the sole object of abduction, vary considerably, and no one can form any opinion as to the degree of abduction desirable except the person who is treating the fracture. This is my point: That there is no one position in which all fractures of any one type must be treated; that each must be dealt with on its merits, and put in such a position as to secure alignment, of which the person who is treating it alone can be the judge. Incidentally it is quite an open question whether fractures of the upper third of the femur should be treated in abduction, as those who followed the papers by Major Lee of Fulham Military Hospital during the war will recall.

The second point which this case tends to emphasize, though no more than the majority of cases in which medical evidence is called for the plaintiff *and* for the defendant, is the hopelessness of the present method of employing medical experts on both sides of a case. Surely it is time that this practice, which scarcely advances medical prestige or makes for equity, should be discontinued, and it should be left to the court to demand and secure expert evidence if required. Having been compelled on several occasions myself to take part in similar farces for material gain I shall escape, I trust, any suspicion of casting mud at individual colleagues. It is the principle to which I object.—I am, etc.,

London, W., Sept. 6th. C. H. FAGGE.

STERILIZATION OF MENTAL DEFECTIVES.

SIR,—In the correspondence on this subject some of the contributors write as if there was only one form of mental deficiency, whereas, as everyone knows, there are several varieties of it and it has several causes. Thus some cases are due to injury to the brain at birth, others to absence of the thyroid gland, others to an arrested development of the brain, and so on. Sterilization is not going to prevent all forms of mental defect, and it is much to be doubted whether its adoption or the institution of State certificates of marriage would really do much to lessen the number of defectives born.

When I was doing out-patient work at the Hospital for Sick Children I took the trouble to inquire, so far as I could, into the family histories of a large number of defective children, and I was unable to satisfy myself that in the main their heredity differed in any way from that of normal children. It would seem that mental defect is a sport or unfavourable variation which may arise in perfectly normal families, just as physical defects do, and that each generation of average parents will produce its own crop of it just as it does of deformities such as hare-lip or club-foot. If this be so the diminution in the number of defectives which would result from the measures proposed would be so small as hardly to be worth while.—I am, etc.,

London, W., Sept. 10th. ROBERT HUTCHISON.

SIR,—Sir G. Archdall Reid, in his letter published on August 26th, succinctly epitomizes some of the leading facts of heredity. The majority of people have very little knowledge of the traits and characteristics of their ancestors; many have only a vague remembrance of their grandparents. It only shows how difficult it is to formulate any definite facts on heredity. When we remember that each of us has four grandparents, sixteen great-grandparents, and so on, it goes to prove how intimate is the relationship between the human family. By this hypothesis it is possible to demonstrate that one's own ancestors exceeded the whole population by going back some generations.

There are certain facts in heredity that appear fairly constant, and one of these is the transmission of various forms of eye defects through apparently healthy females to the male offspring. Dr. W. M. Ash, in the BRITISH MEDICAL JOURNAL of April 8th, gives an account of an interesting family history through three generations of hereditary microphthalmia. Dr. Moriet, as recorded in No. 264, EPITOME of the JOURNAL, March 18th, mentions the case of a family afflicted with hereditary retrobulbar neuritis ending in blindness who reside in a sparsely populated district in Western Australia. At the present moment there are seventeen unmarried girls in this particular family. From one union twelve entirely distinct families have become affected.

In each of the foregoing family histories the females are perfectly healthy and free of any defect, yet practically all the males are more or less blind. Naturally, Dr. Moriet feels some alarm as to the result of any of these seventeen girls marrying and having children, especially in such a sparsely populated country as Western Australia. Again at Bandera, a town in Texas, U.S.A., many of the inhabitants are possessed of twelve fingers and twelve toes. It has been stated that a member of the nobility has a defect in one of his fingers (as well as some of his relatives). The vault of one of his ancestors was opened, and a similar defect was found in the hand of the skeleton, who had been buried a few hundred years ago. Whether these defects were transmitted through the female is not quite clear. They are evidently problems in variation, belonging to the spontaneous form.

With regard to the defective-eye families, a point of interest is, How did these defects originally arise? There must be cases of microphthalmia and hereditary retrobulbar neuritis distributed, not only over this country and Australia, but throughout the world. Had they all a common ancestral origin—a sport of nature?

Germ cells, whether they be those of mammals, fishes, reptiles, or even plants, are very much alike so far as we are able to observe; yet profound changes take place in their development. According to Major Leonard Darwin these changes and developments are attributable to what he describes as the mnemic theory of cellular growth, and no doubt if it were possible to solve this problem it would produce the most profound changes in this world as we know it, and life and existence would be different.

In dealing with such families with such defects of the eye sterilization may possibly act in keeping them under control. Unfortunately there does not appear to be an absolutely certain way of producing sterilization. Women who have had Caesarean section performed have also had a sterilizing operation done at the same time, and have been given medical certificates guaranteeing them from ever becoming pregnant again. In a few months' time they have turned up again

well advanced in pregnancy. Evidently we have still something to learn on this subject, although a surgeon has recently claimed success by tying the Fallopian tubes themselves in knots.—I am, etc.,

Plymouth, Sept. 2nd. J. S. PEARSE.

SIR,—There are five and a half millions of school children in England, of which 1 per cent. is the expectancy of mental defectives, so that the 12,000 for which Dr. Gibbons says we are taxed is but a small part of the 55,000 that exist of persons at school age—say of 5 to 14 years. The school medical service no doubt affords a *locus* of proventive action for the benefit of humanity in the long run, but practically considered the prevention of mental defect by any action whatever would be very intricate and difficult owing to the unending connexions and ramifications of the hereditary lines, and the impossibility of following out the hereditary connexions. To lessen the numerical occurrence of mental defect may be a possibility which a persistent effort extending through a couple of generations would greatly enhance, but to remove the element of recurrence is probably as impossible as to deprive the sea of herrings by fishing. A sufficiently long period of neglect would result in the return to the old state. It would not suffice to limit the effort to England; it would have to be worldwide.—I am, etc.,

Cheltenham, Sept. 9th. J. H. GARRETT.

THE ETIOLOGY OF GOITRE.

SIR,—In the BRITISH MEDICAL JOURNAL of February 4th, 1922, is an article by McCarrison on fats in relation to goitre. On it I would offer some suggestions which might possibly throw some light on the subject and modify the reading of the results of the experiments. McCarrison in his work on goitre has not stressed the important part played by calcium.

Goitre and calcium have such an obvious relationship that no treatise on goitre can be complete unless this point is given its adequate place in the roll of thyroid enlargements. I have dealt with this point in an article in the *New York Medical Journal* (April 5th, 1922), but will make use of such points as have bearing on these experiments. It has long been recognized that the viscosity of the thyroid secretion varies immensely, and this largely depends on its iodine content. In the limestone districts of Switzerland and Derbyshire large goitres containing thick colloid are usual. Analysis has shown this colloid to be poor in iodine. Such goitres vanish under the use of iodine or thyroid extract rich in iodine. The vesicles in a case of Graves's disease or thyrotoxic goitre are usually found empty or their colloid thin. The iodine content of such colloid has been shown to be rich in iodine, and the giving of iodine in these cases aggravates the condition. Colloids in the majority of cases owe their rigidity to the presence of calcium, which is balanced by iodine. Excess of iodine liquefies a gel, the addition of more calcium causes it to regain its rigidity. Professor Kendell of the Mayo Clinic states that there is no calcium in the thyroid colloid, but as has been said large goitres in the limestone districts of Switzerland and Derbyshire with thick colloid vanish under the use of iodine. With this balancing of calcium and iodine in colloids it can readily be understood that with an excessive calcium intake and an actual or relative deficiency of iodine the body colloids would tend to an increased rigidity, even if the kidneys were excreting calcium normally. The calcium picking up the available iodine would prevent it combining with the colloids, as is well illustrated by the reduced rigidity of body colloids in myxoedema when thyroxin or thyroid extract rich in iodine is given. These and many other factors lead one to the conclusion that calcium and iodine are intimately connected in the thyroid metabolism, and that each plays its part in the production of goitre.

The next question to consider is the absorption of calcium. In milk we have a marked illustration of the relationship between fats and calcium, also an example of the enormous amount of calcium relatively necessary to the human body. I have been struck repeatedly when one case of goitre appears in a family all of whom are subjected to the same conditions, including tonsillar infections, that the individual affected took no milk. It must be quite obvious that the calcium soaps formed from milk cause no trouble, yet when butter is given trouble arises. The solubility of different soaps varies, some fats producing a more soluble soap than others. Owing to the unsaturated condition of its fats the soap formed with cod-liver oil exceeds all others in its properties of solubility. At times protracted diarrhoea is set up by insoluble soaps irritating the bowels. It is claimed by some authorities that cod-liver oil contains bile; if so, the presence of lecithin and cholesterin would materially help in breaking down the soaps formed from these fats.

Pigeons as well as tadpoles normally take very little fat and their powers of dealing with it will not be of a very high order. As we know from experience that human beings at times are unable to break down calcium soaps, it can readily be conceived that pigeons and tadpoles would likewise fail if that mechanism was taxed beyond its power. Soaps formed from the fatty acids of butter and oleic acid will be broken down with far greater difficulty than those formed from cod-liver oil. The solubility of soaps is due to the bile action, depending chiefly on the presence of lecithin and cholesterin. Starling says: "If the reaction be alkaline the alkali will combine with the fatty acids to form soaps. Analysis of the content of the gut after a fatty meal shows that the greater proportion of the fats are present as a mixture of fatty acids and soaps, the amount of these substances compared with the unchanged fats increasing as we descend the gut." We must deduce from this that fat taken above normal requirements will form soaps with the fatty acids combining with all the calcium and other alkalis present; this may well lead to calcium starvation. To explain the action of the iodine in benefiting goitres in the presence of fats, I may suggest that the iodine combines with the calcium to form calcium iodide; the calcium having such a close affinity for iodine would combine with that in preference to combining with the fatty acids, and so make some calcium available to the system. This, to some extent, is borne out by the type of goitre produced, as in no case was there a tendency to a retention of colloid, as is seen in the Swiss and Derbyshire goitres, but a type of goitre was produced of the thyrotoxic kind verging on that found in Graves's disease in which there is either an excess of iodine or a deficiency of calcium, practically resulting in the same thing. In support of the view of the power possessed by cod-liver oil in carrying calcium into the system, I will refer to the work of Drs. Park and Howard,[1] who confined their attentions to the influence of cod-liver oil in rickets; their results were more definite than those of Phemister and his colleagues. The changes discoverable by radiographic means began four to five weeks after the commencement of treatment. The first evidence of repair was a line due to the deposition of calcium, which appeared between the extremity of the shaft and the centre of ossification in the epiphysis. The line became thicker and gradually spread so that the cartilage in the transitional zone became transformed into bone and infiltrated with lime. The calcium was so deposited that the end of the shaft assumed the appearance of a cup or crater embracing the nucleus of ossification. With a view to assisting the absorption of calcium I have recommended the use of bile salts.[2] At the same time I was evolving a method for testing small quantities of calcium in the blood, which was read before the Royal Society of Melbourne.[3]

The results of my experiments and the work of others led me to the conclusion that it was hopeless to look for any deficiency of calcium in the blood, as a certain proportion of calcium is necessary for the life of the individual; anything above is rapidly excreted, and anything below means death; to maintain this amount constant the supplies in the tissues and bones are called upon. This can be seen in animals put on a calcium-free diet, the epiphyseal junctions showing very marked increase of vascularity, suggesting a robbing of calcium from the bones. The same thing obtains when large doses of thyroid extract are given to rabbits; this strengthens the contention that in all cases of overactivity of the thyroid there is increased calcium output, very obvious in tuberculosis, and accounting for the liability to haemorrhage in these thyrotoxic cases. This can always be corrected by the administration of calcium salts. The haemorrhagic tendency exists in spite of the fact that no appreciable diminution of the calcium content of the blood is found. Those who have to remove infected tonsils in these cases are well aware of its value. This opens up the question whether although calcium may be present in sufficient quantities it may not be in the right combination or colloidal form.

As to the part possibly played by the onion, it is to be noted that the essential oils of garlic and onions have a very powerful bactericidal action, and so may have a very decided effect in eliminating the cause of thyroid enlargement.

[1] *Medical Journal of Australia*, December 17th, 1921, p. 573.
[2] Ibid., November 7th, 1914.
[3] Ibid., November 17th, 1917.

Early in 1915 I began to see the relation between focal infections and goitre, and in March began to treat the condition by their removal, about the same time as Rupert Farrant was coming to the same conclusions at the other side of the world. Since then I have never seen any goitre without focal infection, and by removal and other treatment I have been able to deal satisfactorily with all my cases, only failing in those in which I was not able to remove the infection. Whilst fully recognizing the importance of bowel infection in endemic goitre, I would like to say that I have never seen a case in Australia. Since McCarrison's work was published many medical men have been trying to cure goitres with intestinal antiseptics where there was an obvious infection of the tonsils. In nearly all acute infections, and most others, there are signs of an overactive thyroid, irrespective of any enlargement, as shown by the signs of increased nervousness, tachycardia, and tremor. In all such cases there is a tendency to thinning of the colloid; these symptoms will predominate in districts poor in calcium or rich in iodine. In districts rich in calcium or poor in iodine infections will tend to produce a colloid which is too rigid to pass into the circulation, and will therefore accumulate in the vesicles; if any symptoms are associated they will be those of deficient thyroid activity. One must view the normal colloid as being of such rigidity as to pass into the circulation when a call is sent. If it is too rigid it will not pass but accumulate; if too thin it will pass continuously into the system. With these views in mind I cannot help coming to the conclusion that the part played by the fat in the production of goitre is only a link in the chain of calcium absorption or starvation.—I am, etc.,

SYDNEY PERN, M.R.C.S., L.R.C.P.Lond.

Melbourne, Victoria, July 24th.

BONE GRAFTING AND THE CIRCULAR MOTOR SAW.

SIR,—In his article on the treatment of spinal caries by bone grafting (BRITISH MEDICAL JOURNAL, July 15th, p. 73) Sir Henry Gray discusses the question of how the graft should be cut, and I fear that, however satisfactory he has found his method, a rather erroneous impression is given regarding the use of the circular motor saw. In my opinion the Albee outfit is a great acquisition to a surgeon's set of tools. The long experience of Albee and the large number of cases successfully treated by him cannot be lightly set aside. His *x*-ray proofs are as fine as may be seen anywhere.

These results have been obtained by operation where the circular motor saw has been used. Therefore, the destruction of the osteoblasts in the graft, so cut, does not occur. This certainly has been my own experience, and I maintain that the frictional heat generated by the rapid circular saw is not so great as might be imagined. It has been shown that a saw working at 250 revolutions a minute generates only 4 degrees less heat than one at 6,000. Then, again, it must always be remembered that it is only fair to the instrument that a sharp blade should be used. The use of a cold saline solution drip is indicated in cases where thick adult cortex is cut, and all spluttering of saline, blood, etc., may be prevented by the "guard" attachment to the "shell" of the motor.

It is many years now since I employed an exactly similar method to that described by Sir Henry Gray—namely, the drilling of holes along the line of section of the graft from the shaft of bone, in order to prevent splintering by the osteotome, which usually occurs if such drill holes are not made, and which may occur even when they are made.

There is no instrument that can cut such a perfect graft as the circular motor saw. Again, there is no comparison between the old and new methods when speed is taken into consideration. In bone-grafting operations, particularly those required for spinal caries, speed is an important factor. A very large number of such cases occur in quite young children, who bear prolonged general anaesthesia badly. There are few of us who do not know how expert Sir Henry Gray is in the use of local anaesthesia; but I am sure that the bulk of such operations in very young subjects are performed by the majority of less expert surgeons under a general anaesthetic. There, speed is an important factor.

There is another large area in the field of bone surgery where the question of bone grafting is very important—namely, the treatment of delayed union of fractures of the long bones. It is a matter of common experience to find now and again a case in which bone repair at the seat of fracture is either long delayed or is non-existent.

Such cases may be due to the interposition of muscle, etc., between the broken ends, but there are others where no recognizable displaced tissue has been interposed, and it is assumed that the delay is due to a disturbance of the normal metabolism. This is frequently admitted, in part at least, by the administration of thyroid extract to the patient in the hope of stimulating in one or more directions the metabolic changes necessary for bone repair.

These are just the cases where, if Sir Henry Gray's contention is correct that considerable damage is inflicted upon the osteoblasts of the graft by the frictional heat of the motor saw, one would expect a large percentage of failures. I do not possess the experience of a Gray nor an Albee in bone surgery, but I have treated such cases by the inlay bone graft, cases in which I had great difficulty to account for the delayed union. I have found that the Albee graft does very well indeed, especially if it is steadied laterally by thin bony wedges placed along the sides of the graft bed, coupled with the use of retaining strands of kangaroo tendon to prevent movement of the graft towards or from the medullary cavity of the bone under repair. It is to be remembered that we are cutting, not the thin delicate tibial shaft of the young child, but the dense cortex of the adult bone where the frictional heat of the saw should be almost at a maximum. Yet they do well—the grafts neither disappear nor become sequestra.—I am, etc.,

GEORGE ROBERTSON, F.R.C.S.Edin.,
Honorary Surgeon, Dunfermline and West of Fife Hospital.

August 31st.

MUSCLE NECROSIS.

SIR,—I read with interest the case of muscle necrosis due to intramuscular injection of quinine reported in a recent issue of the JOURNAL. I saw several cases while attached to No. 1 General Hospital, Wynberg, and was so impressed with the serious results of these cases that I ceased to give injections beneath the fascia, and for eighteen months treated my cases by subcutaneous injections with excellent results; in about six cases slight necrosis occurred at the site of injection, which soon healed.

Briefly, the advantages obtained by quinine given this way rather than orally are:

(1) It can be given when, owing to vomiting, quinine cannot be given by the mouth. (2) The quinine is present in the blood while the malaria parasite is free in that fluid. (3) It relieves quickly muscular pains present in some cases of malaria. (4) In anaemic and debilitated subjects apparently large doses of quinine taken by mouth are not absorbed. (5) It acts quickly and certainly (a big advantage in cachectic patients): six to eight injections of from 5 to 10 grains, and the patient is convalescent.

At the request of Colonel v. Zyl I read a paper before the Cape Town Branch of the British Medical Association, in which temperature charts of over 100 cases treated by injections were handed round; the paper was published in the *South African Medical Record*, July, 1918.

My object in writing this letter is to warn men new to treatment of malaria of the danger of intramuscular injections, and to assure them that the subcutaneous method is just as efficacious without the risk of muscle necrosis, which I am sure is not due to faulty technique but to the action of quinine in some patients who appear very susceptible to the drug.—I am, etc.,

H. KNIGHTS RAYSON, M.D.Brux.,
M.R.C.S., L.R.C.P., late Captain S.A.M.C.

Bayville, U.S. Africa. Aug. 20th.

NEW REGULATIONS FOR TRAINING FOR THE D.P.H.

SIR,—A typographical error has crept into the otherwise very accurate report of the Public Health Section at the Glasgow Annual Meeting and of the arrangements made for the teaching of public health in this city and port (BRITISH MEDICAL JOURNAL, August 26th, p. 364).

Section 1 of the syllabus reads: "Interviews with the *Ministry of Health* as often as possible"; obviously this should read: "Interviews with the *Medical Officer of Health* as often as possible."—I am, etc.,

E. W. HOPE,
Medical Officer of Health.

Liverpool, Sept. 7th.

SIGHT-TESTING OPTICIANS.

SIR,—The letter from Mr. Parkinson Higham (September 9th, p. 489) advocating the giving of a charter to opticians in order that they may be bound down to a strict code of etiquette is a very dangerous one. The same argument was used with regard to midwives, and the result is that midwives are now in an established position, registered by the State, and have taken away from medical men the majority of midwifery cases. Before they were recognized the public knew that they were taking a certain risk in going to midwives: now they look upon them as able to do their work as well as a medical man. You may give a man a diploma and register him, but you cannot bind him down to carry out any rules and regulations.

The supply of spectacles by opticians is a scandal, and in many cases a swindle. It is a purely business transaction, and the more advertisements appear in the papers that assert the wonderful knowledge of eyesight possessed by these opticians, and the more extravagant their claims, the greater their takings and the greater the harm they do.

The trade of the optician must be very lucrative indeed. The charges they often make for spectacles would cover a medical man's fee as well as the cost price of the spectacles at a wholesale house. It is astonishing to see the enormous number of people who wear spectacles nowadays. And yet those who know something about eye diseases all acknowledge that it is dangerous to prescribe spectacles without knowing something about diseases of the eye. Retinoscopy is also essential in most cases. But I am afraid that it is the fault of the medical profession that opticians have attained the position they have already. There are many medical men in general practice who would do refractions for a fee of half a guinea, but the public do not know of them. The result is that the work is done by ophthalmic surgeons only, whose fee is prohibitive to many people. Consequently the public go to opticians. A medical man in general practice cannot advertise that he does refraction work, and the public do not know of his existence. There also seems to be a disinclination on the part of many practitioners to send their patients to another for refraction work. I wonder whether a medical man who set himself up to do refraction work at a fee such as mentioned above would get the support of his professional colleagues, and how would it be possible for him to let the public know that he does this work? What would be a suitable title for him to adopt? How would it be for him to put on his plate "Ophthalmic Surgeon," "Refraction work only," or something of this kind? If he puts "Eye testing" or "Spectacles prescribed" he runs a risk of being mistaken for an optician. Can you suggest a title, Mr. Editor?—I am, etc.,

Hastings, Sept. 11th. ARTHUR E. LARKING, M.D.

*** We can see strong objections to any kind of legend or other device which could be interpreted as a means of attracting the attention of the public.

Obituary.

SIR CHARLES RYALL, C.B.E., F.R.C.S.,

Senior Surgeon to the Cancer Hospital, London, and to the Bolingbroke Hospital.

THE announcement of Sir Charles Ryall's sudden death on September 5th while on holiday at Dornoch was an overwhelming shock to his many friends, especially to those who only a few weeks previously had seen him in London vigorous, alert, and cheerful as he always was. The very morning of his death he wrote to his secretary in London saying that he had never felt better, and arranging that a party of friends be asked to shoot with him in Hertfordshire next week. An anginal attack while at the luncheon table—and within a few moments all was over.

Born in 1869, Charles Ryall traced his descent from one of Cromwell's officers who settled in Ireland at the termination of the Irish wars, and was the son of E. C. Ryall, who served through the Crimea and the Indian Mutiny in the A.M.D. After obtaining his medical education at Dublin University Ryall spent a year or two in post-graduate work in Paris and London, and was then appointed house-surgeon to the Cancer Hospital. While holding this post he became F.R.C.S., and so impressed were the authorities of the hospital by his sagacity, energy, and ability that he had the unusual experience of being elected to the honorary staff while still a house-surgeon. This was the starting point of Ryall's successful career. He became surgeon to the Cancer Hospital at a time critical in its fortunes, and it is impossible to overestimate the far-reaching influence he exercised. Aseptic surgery had just made its appearance, and his tact, skill, and sound judgement played an all-important part in placing the work of the hospital in the position it occupies to-day.

The Cancer Hospital was always foremost in his thoughts; he was devoted to its interests, and his far-seeing and statesmanlike views were of untold value to his colleagues and to the house committee. But there were many other spheres of activity that claimed Ryall's attention. The Lock, the Gordon, and the Bolingbroke Hospitals all received many years of ungrudging service. From the two former he retired some time ago, but at the time of his death he was senior surgeon to both the Bolingbroke and the Cancer. These were the clinical centres where Ryall built up a reputation for clinical acumen, technical dexterity, and sound judgement which earned for him the respect and esteem of his fellow surgeons and, in fact, of the whole of his professional brethren.

The commanding position that Ryall had come to occupy was shown in unmistakable manner by the overwhelming voting which returned him at the top of the poll on his election to the Council of the Royal College of Surgeons. This was a notable—indeed, an unprecedented—achievement for a man who was not on the staff of a teaching hospital, and who could not, therefore, command the solid support ensured by such a position. Ryall naturally came to be regarded as the representative and champion of the special and non-teaching hospitals, and fully did he justify the confidence that had been placed in him.

Very soon after the outbreak of war, like so many others who found themselves over the age acceptable to our military authorities, Ryall was at work for the Belgians; but, following upon the German advance, he had to return to London, and at once became engaged in every kind of war activity. Overburdened with surgical work at his own hospitals owing to the absence of the younger men, he yet made time to carry out much useful work at King George V Hospital, the Countess of Carnarvon's Hospital, and many of the smaller officers' hospitals that sprang into being all over London. A little later in the war he was able to render services of the greatest importance to the nation, for, with the institution of compulsory military service, the need for just such men as Ryall was at once manifest. As a member of the Special Medical Appeal Board, the Advisory Medical Board for National Service, and many other similar bodies, he was exactly in his element. His great tact, unerring judgement, and wise discretion rendered him absolutely invaluable, and had he lived it is certain that he would have been called upon to carry out still more important duties in this sort of capacity.

Wide interests and a far too busy life left little time for writing, and Ryall's contributions to surgical literature were few, but what he did write stood the test of time. Almost his earliest observation was the danger of cell implantation during the course of cancer operations, and it has had an important influence in the surgery of malignant disease. Member of the International Surgical Society and Organizing Secretary for next year's congress, President of the Subsection of Proctology of the Royal Society of Medicine, member of the Committee on the Physical Education of Girls, Past-Master of his Masonic Lodge (No. 2000), and chairman of one of the subcommittees of the Council of the College of Surgeons—it is impossible to realize how Ryall got through it all. He never spared himself—an emergency operation, a tiresome committee, a medical meeting, a lecture by a friend or colleague, he was always there and always the same—cheery, optimistic, friendly.

No picture of Ryall would be complete without some reference to his life outside his professional work. He was a great sportsman, and whether it was shooting, fishing, golf, or mountaineering he showed the same eager spirit and the same boy-like aptitude for enjoyment that was such a lovable trait in his character and so endeared him to his friends. Ryall had a genius for friendship. There is no one who had more friends and no one who deserved more. Simple, modest, unassuming, he inspired loyalty and affection in all who came in contact with him. Those of us who were privileged to know him intimately had a regard for him not easily put in words—to each and every one of us he was wise counsellor, genial companion, and closest friend, and we loved him. "To be a prop of strength to a human soul in a moment of weakness is to know the glory of life." C. R.

We are indebted to Sir JAMES GALLOWAY for the following appreciation: The intelligence of the sudden death of Sir Charles Ryall must have come as a shock to his many friends and colleagues. We were on vacation as he was, and the bad news struck us on casually glancing over the columns of the daily paper. Charles Ryall's generous and sympathetic nature made him a welcome friend in a wide circle, and those who had the advantage of knowing him valued his good judgement and broad sympathies as well as his bright and friendly temperament. His qualities of sound reasoning and kindly judgement were well known to his professional brethren, and were specially well observed and indeed developed during the years of the war, when he acted as Medical Assessor to the appeal tribunals in close association with the Local Government Board and the Ministry of National Service. Ryall was the right man in the right place to fulfil the duties required at that difficult and critical time. The cases of those seeking exemption from or mitigation of military service were numerous, difficult, and frequently vexatious; but however vexatious and however ingenious were the difficulties raised Ryall would judiciously and sympathetically deal with the multifarious objections and also with the many true difficulties. There can be no doubt in the minds of those who worked in closest association with Ryall at that time that the work during 1917 and 1918 tried him severely, both mentally and physically. His premature departure affects many, but in a very special way those whose friendship with Charles Ryall became a very intimate and living thing during the difficult days of the war.

Dr. ARCHIBALD LEITCH writes: The outstanding quality that endears a man to his fellows, that lights up the eyes with pleasure at his coming and keeps green memories when he passes, is goodness of heart, and if ever a man had a heart of gold it was Charles Ryall. He radiated kindness: he was for ever doing kind and thoughtful deeds. Many a one he helped who was down and out. Many a young man struggling upwards, who perhaps knew nothing of his influence unostentatiously and even surreptitiously exerted, had him to thank largely for success. However successful a man may be there come times when he needs a friend to give him confidence and to stand by his side in crises, and Charles Ryall was always ready. He thought and said the best of other people: no tinge of acerbity, envy, or malice coloured his criticism; he had no enemies, and all his acquaintances were his friends. We, his colleagues, loved him. With his wide sympathy and understanding he made our interests and difficulties his very own. His wonderfully sound judgement, operative dexterity, and quick wit and resource in emergencies made him a surgeon's surgeon, so that when illness affected us or our families he was the one to whom we first turned for advice and comfort. The well-merited honours that came to him were to us personal pleasures. He sacrificed himself during the war doing the work of a dozen men; it broke his health and left him a tired man, but his tireless soul permitted him no rest from the calls of duty. His life was happy and good. Beyond doubt there was written under the records of his stewardship "good and faithful servant" when this last sudden poignant call took our trusty and lovable friend away.

A largely attended funeral service was held on September 9th at Christ Church, Marylebone, and in the presence of sorrowing relatives, friends, and colleagues the interment took place at Kensal Green. A devoted wife is left to mourn his loss, and deep sympathy is felt for her in her sorrow.

J. A. MANSELL MOULLIN, M.B., M.R.C.P.,

Consulting Physician, Hospital for Women, Soho Square.

DR. JAMES ALFRED MANSELL MOULLIN, who died on August 14th, was educated at Oxford University, Dublin, and St. Thomas's Hospital. He graduated B.A.Oxon. in 1872, M.A. in 1875, and M.B. in 1877. In the following year he obtained the membership of the Royal College of Physicians of London. He was associated with the Soho Hospital for Women for some forty years, and took a very considerable part in the reorganization of its work. At the time of his death he held the post of consulting physician to that institution. He was also in succession assistant physician, physician, and consulting physician for diseases of women at the West London Hospital. He was a former president and treasurer of the British Gynaecological Society before it became amalgamated with the Royal Society of Medicine.

A colleague writes: Mansell Moullin's interests were almost exclusively confined to gynaecology, and he cared little for midwifery. As a surgeon he was fearless and dexterous and very much enjoyed his operative work. He was the author of many contributions to gynaecological literature. In public he had a shy and retiring manner and was from this cause perhaps little known by the majority of his colleagues. To those with whom he was thrown professionally he was always courteous and considerate. One of his recreations was shooting, to which he looked forward each year with great keenness and about which he was ever more than willing to talk.

WE regret to record the death, after a prolonged illness, of Dr. ROBERT WYNNE STANLEY WALKER, of St. Heliers, Jersey, which took place at the residence of his father, Glenu Hall, Leicester, at the age of 39. Dr. Walker was educated at Cambridge University and University College, London. He graduated M.A., M.B., B.Ch. in 1908, and proceeded M.D. in 1910, being awarded the Raymond Horton-Smith prize for his M.D. thesis on congenital heart disease. After holding resident posts in University College Hospital, the Hospital for Women, Soho, and the Great Northern Hospital, he went into practice in Jersey, where he was appointed honorary surgeon to the Jersey Dispensary and Infirmary. He was honorary secretary and treasurer of the Jersey Division of the British Medical Association. During the war Dr. Walker joined the R.A.M.C. and went out to Salonica, and on war service he contracted tuberculosis. The strain of medical practice during the influenza epidemic a few years ago aggravated his tuberculous trouble, and of recent years he had spent the winters in Switzerland and the summers between his home in Jersey and Glenn. Dr. Walker made several contributions to medical literature. His many friends will regret the untimely end to what had promised to be a brilliant career.

JOHN ANDREW TURNER, M.D.Edin., D.P.H.Camb., late health officer of Bombay, died recently in London. He was educated at Edinburgh, and after qualifying turned his attention to sanitary work. His first appointment in this line was H.O. of a district of Leicestershire and Rutland, and subsequently he became M.O.H. for Hertfordshire. From this appointment he proceeded to Bombay in the year 1901. Plague broke out in that city in the latter part of 1896, so that on his arrival the H.O. was called upon to face the problem of starting remedial measures, very little having been done in the four years previous. At that time the epidemiology of the disease was very ill understood, so that it was no light task that the H.O. had to face. The problem of ridding huge oriental cities of this disease is still awaiting solution. At the same time Bombay owes much to Dr. Turner for many improvements in sanitation and housing. He paid particular attention to tuberculosis and venereal disease in the later part of his career, and went in for a vigorous campaign of propaganda against both of these diseases, leagues of lay workers and local practitioners being formed to assist. He was awarded the C.I.E. shortly before his retirement. On settling in London he obtained a temporary post under the Ministry of Health, but he vacated this some months before his death.

WE regret to record the death from drowning, while on holiday in Anglesey, of Dr. ARTHUR HOWARD of Macclesfield. While bathing with a large party in a rough sea at Rhydwen he and several others got into difficulties, but although his companions were rescued Dr. Howard was carried out of sight by the waves, and his body was not recovered until some hours later. He received his medical education at Owens College, Manchester, and graduated M.B., Ch.B.Vict. in 1903. He had held resident appointments at the Kent and Canterbury Hospital and Northampton General Hospital, and was formerly resident superintendent of the Borough Hospital, Birkenhead.

THE death took place on September 1st, at Llandudno, of Dr. DAVID LLEWELLYN DAVIES, of Neath, in his 77th year. He had been visiting North Wales and fell and fractured a leg at the Swallow Falls, whence he was conveyed to a nursing home in Llandudno. Dr. Davies was educated at the University of Glasgow, and graduated M.B., C.M. in 1874. He was medical officer to the Neath Union Workhouse, a justice of the peace, and held many other public appointments in the district, where he carried on a large practice and was deservedly popular.

THE death took place recently at Paisley Royal Infirmary of Dr. ALEXANDER MACLEAN, who was for fourteen years a member of the medical staff of the Glasgow Public Health Department. Dr. Maclean was educated at Glasgow University, where he graduated M.B., Ch.B. in 1902; he took the D.P.H. of the Royal Colleges of Physicians and Surgeons of Edinburgh in 1903. He was formerly senior assistant medical officer at the Western District Hospital, Glasgow, and on appointment to the Public Health Department he became assistant bacteriologist. He devoted special attention to the relation of housing conditions to disease, and for a number of years held a special post as junior medical officer for housing purposes; in 1920 he was transferred to the northern division of the city as a clinical medical officer.

Universities and Colleges.

UNIVERSITY OF CAMBRIDGE.

THE next examinations for medical and surgical degrees will be held at the beginning of October. Parts I and II of the First M.B. Examination will begin on October 3rd, and Part III on October 5th. Part II (pharmacology and general pathology) of the Second M.B. Examination will begin on October 2nd.

SOCIETY OF APOTHECARIES OF LONDON.

THE Diploma of the Society has been granted to the following candidates entitling them to practise medicine, surgery, and midwifery: E. E. Briant, A. Gugenheimer, F. D. Howitt, and W. J. Verheyden.

The Services.

DEATHS IN THE SERVICES.

Surgeon Rear Admiral George Trevor Collingwood, C.B., R.N. (retired), died at King Edward's Convalescent Home, Osborne, Isle of Wight, on September 2nd. He was born in 1863, educated at the London Hospital, and, after taking the M.R.C.S. and L.R.C.P. Lond. in 1886, entered the navy as surgeon in the following year. He attained the rank of surgeon rear admiral on July 4th, 1920, and retired in 1921. As surgeon of the *Widgeon* he served in the Naval Brigade landed at Bathurst, on the Gambia river, in February, 1894, for the punishment of Fodi Silah, a slave-raiding chief; in September, 1894, in the expedition against the chief Nanni, on the Benin river, and was present at the capture of Brohemi, the chief's stronghold, in September, 1894; and in the expedition against King Koko, of Nimby, on the Brass river, in February, 1895, was mentioned in dispatches, and received the Africa General Service medal, with three clasps. From 1909 to 1912 he was P.M.O. at the Royal Naval College, Osborne. In the recent great war he served in the Dardanelles, on H.M.S. *Inflexible*, and afterwards in charge of the naval hospital ship *Soudan*; and after the war was appointed head of the naval hospital at Malta. He received the Sir Gilbert Blane gold medal in 1909, the M.V.O. in 1910, on the occasion of King George's visit to Osborne, and the C.B. in 1919.

Inspector-General Henry MacDonnell, C.B., R.N. (retired), died at Southsea on September 2nd, aged 83. He was born in 1839, the son of William MacDonnell, Esq., of Dublin, educated in that city, and, after taking the L.R.C.S.I. in 1860 and the L.K.Q.C.P. in 1861, entered the navy as assistant surgeon in 1861. He attained the rank of inspector-general in 1897 and retired in 1899. He was in charge of Malta Naval Hospital from 1893 to 1896, Chatham Hospital 1896-97, and Haslar Hospital 1898-99. As fleet-surgeon of H.M.S. *Invincible* he served at the bombardment of Alexandria on July 11th, 1882, and during the Egyptian war, receiving the medal with a clasp and the Khedive's bronze star. He was granted the C.B. at Queen Victoria's diamond jubilee in 1897, also the jubilee medal. In 1886 he married Frances Alice, daughter of the late Sir William R. Holmes, Consular Service, of Kilrea, Ireland.

Colonel Edward Horace Lynden Lynden-Bell, C.B., A.M.S. (retired), died in the Officers' Hospital, Millbank, on September 1st, aged 63. He was born on December 18th, 1858, the son of Major-General T. Lynden-Bell, of Brook Hill, co. Wexford, and educated at Edinburgh University, where he graduated as M.B. and C.M. in 1882. Entering the R.A.M.C. as surgeon on August 4th, 1883, he attained the rank of lieutenant-colonel after twenty years and colonel on September 19th, 1912, retiring on December 26th, 1917. From 1912 to 1914, and again in 1917, he held the post of D.D.M.S. London district. He served in the Burma campaign in 1885-89, receiving the Indian frontier medal with two clasps; and in the war of 1914-18, when he was mentioned in dispatches in the *London Gazette* of October 19th, 1914. He received the C.B. in 1915, and was appointed a Knight of Grace of the Order of St. John of Jerusalem in 1916.

Lieut.-Colonel Lewis Haywood, R.A.M.C. (retired), died at the Officers' Hospital, Brighton, on August 31st, after a long illness, which dated from the South African war. He was born on August 10th, 1857, educated at Aberdeen, where he graduated as M.B. and C.M. in 1880, and entered the army as surgeon on February 4th, 1882. His name was then Lewis Haywood Truefitt, but he subsequently dropped the surname. He attained the rank of lieutenant-colonel after twenty years' service, and retired on October 22nd, 1902. After his retirement he was employed at Scarborough in 1903-04, Aldershot 1905-07, and Lincoln in 1908-09; in 1909 he was appointed staff officer to the A.M.S., South Midland Division, R.A.M.C.(T.F.), and subsequently D.A.D.M.S. of that division. He served in the South African war in 1899-1901, and took part in the relief of Ladysmith, including action at Colenso, operations on Tugela Heights, action at Pieter's Hill, and operations in the Transvaal, including the action at Zilicatis Neck, was mentioned in dispatches in the *London Gazette* of February 8th, 1901, and received the Queen's medal with four clasps.

Medical News.

A POST-GRADUATE course will be held in medicine, surgery, and pathology at Addenbrooke's Hospital, Cambridge, from Monday, September 25th, to Saturday, September 30th. There will be a morning session from 11 a.m. to 1 p.m., and an afternoon session from 2 to 5 p.m. each day. The times have been so arranged as to enable as many as possible of those wishing to attend to carry on their practices at the same time. There will be no fees for the course. A dinner will be held on Tuesday, September 26th, at 7 p.m. A programme and further particulars can be obtained from the secretary to the staff, Addenbrooke's Hospital, Cambridge.

THE opening ceremony of the winter session at King's College Hospital Medical School, Denmark Hill, will be held at 2.45 p.m. on Tuesday, October 3rd. The introductory address will be given by Sir Herbert Jackson, K.B.E., F.R.S., with Viscount Hambleden in the chair. The annual dinner of past and present students will be held at 7 for 7.30 on the same day at the Café Royal, Regent Street, W., with Dr. Percy Lewis in the chair.

THE third annual lecture conference for welfare supervisors organized by the Industrial Welfare Society will be held at Balliol College, Oxford, from September 15th to 20th. This year the conference is open to both men and women, special arrangements having been made for the women delegates at Lady Margaret Hall. The Session will be opened by Mr. J. W. Pratt, M.P., Parliamentary Under-Secretary for Scotland. The programme will deal with such subjects as "Welfare under the Whitley principle," "The employment department: its functions and personnel," "Health, first aid, safety." Mr. Frank Hodges, Secretary of the Miners' Federation, will give an address on "Health and welfare in the mining industry," and Dr. H. M. Vernon, of the Industrial Fatigue Research Board, will speak on "Record keeping and statistics." Inquiries regarding the conference should be addressed to the Industrial Welfare Society, 51, Palace Street, Westminster, S.W.1.

SIX months' Courses of Lectures and Practical Instruction in Part I (Physics and Electro-Technics) and in Part II (Radiology and Electrology) for the Diploma in Medical Radiology and Electrology of the University of Cambridge will be given in London, beginning October 3rd, 1922, and in Cambridge and London, beginning January 9th, 1923, for examination at the end of the courses. For further particulars application should be made to Dr. Stanley Melville, 12, Stratford Place, London, W., or to Dr. F. Shillington Scales, Medical Schools, Cambridge.

A COURSE of lectures on maternity and child welfare and school hygiene will be delivered at the Royal Institute of Public Health, Russell Square, London, during October, November, and December. Medical practitioners, medical students, health visitors, and others engaged in any form of public health service are invited to attend. The opening lecture on Wednesday, October 18th, at 4 p.m., will be given by Professor Louise McIlroy on the influence of ante-natal care upon infant mortality. Particulars may be obtained from the honorary secretaries at 37, Russell Square, W.C.1.

DURING the last twelve months 32,414 rats were destroyed in the docks and warehouses of the Port of London Authority, compared with 39,112 in the previous year.

DR. HUBERT WORK, Postmaster-General of the United States, and formerly President of the American Medical Association, was the guest of honour at a dinner given in Washington by the Panama Chargé d'Affaires, Señor Lefevre, in recognition of the co-operation of a committee of the American Medical Association appointed to act with the board of directors of the Gorgas Memorial.

AN interallied congress on cancer will be held at Strasbourg in the spring of 1923, when the following topics will be discussed: (1) Experimental production of cancer; (2) spontaneous and provoked reactions of the organism against cancer; (3) treatment of cancer of the breast by irradiation.

THE Russian Pirogoff Surgical Society of Petrograd has announced that the fifteenth Russian Surgical Congress will take place from September 24th to October 1st. The organization committee consists of the council of the society, of which Professor Grekow is president, associated with a number of other members of the society. The chief subjects for discussion will be: (1) the anatomy and pathology of the vascular system; (2) chronic ulcer of the stomach; (3) surgical complications of exanthematic and recurrent fever; (4) treatment of surgical tuberculosis.

AT the third annual convention of the Canadian Radiological Society, held recently at Winnipeg, Dr. Lewis J. Carter of Brandon, Manitoba, was elected president.

IT is announced by the United States Treasury that Dr. J. W. Scherechewsky, assistant surgeon-general, U.S. Public Health Service, has been commissioned to conduct an investigation into the cause of cancer; the headquarters of this investigation will be established in Boston.

IT is reported from Manila, according to the *Journal of the American Medical Association*, that numbers of "chiropractors" have recently arrived in the Philippine Islands from the United States. They have bought full-page advertisements in the local newspapers, claiming to cure almost every ailment, and they are attempting to get a bill submitted to the Legislature regulating the practice of "chiropractic" and to establish a chiropractic examining board for the Philippines.

THE leading educational institutions in eastern China are co operating in a project to found a medical school in Shanghai. This proposal was abandoned last year by the China Board, but is now being revived with considerable assurance of success. The suggestion is to combine Chinese and American funds and build a union medical school, using St. John's medical department as a nucleus of the new school. The Women's Union Missionary Board has decided upon Shanghai as the best place to found a women's medical college, and is entering whole-heartedly into the present union scheme.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Mediocra, Westrand, London*; telephone, 2630, Gerrard.

The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh*; telephone, 4361, Central).

QUERIES AND ANSWERS.

SHELTER LIFE FOR CHILDREN.

DR. WM. J. AITKEN QUINE (Chinley) writes: In reply to the inquiry from "Alpha" (p. 493) I may say that in my opinion shelter life for a 4 year old child in Derbyshire is perfectly feasible, provided that the feet are kept warm by a large, well-protected, hot-water bottle at night in cold weather. The climate is damp, more especially on the western slopes of the Pennines, but *not* foggy to any marked degree. On the other hand fog, when formed, is often very slowly dissipated from enclosed valleys such as that in which Buxton lies. The county health authorities provide a useful form of shelter for suitable tuberculosis cases, and evidence of the way in which open air life is adopted is to be found in the great reluctance of even small children to give them up and sleep indoors again.

EPIDEMIC STOMATITIS.

"CLOYBANK" asks for references to recent recorded cases of epidemic stomatitis in children. There have (he says) been three cases in one family in my practice, the chief features of which have been small ulcers of gums and lips, foul tongue, mild febrile reaction, and anorexia.

CERTIFYING FACTORY SURGEONS.

"J. E." asks what remuneration a certifying factory surgeon usually receives, and to whom an application should be made when a vacancy occurs. We have referred the question to a correspondent with special knowledge, and his reply is as follows:

Examination of Young Persons.—The Factory Act (Sec. 134) enables the employer and the surgeon to arrange the amount of fee or annual charge, and this is extensively done. In the absence of an agreement the remuneration must be by fixed scale, which allows, at present, 2s. 6d. per visit or, if more than two are examined, 1s. per head; mileage at the rate of 6d. per complete half mile after the first is to be added. For examination at the surgeons' rooms the fixed fee is 1s. per person.

Examinations under Regulations.—The scale is as above, and although nothing is said about mutual arrangements there is no reason why an employer cannot pay as much as he cares to.

Investigation of Accidental and other Poisonings and of Certain Industrial Diseases.—The fees, which are paid by the Home Office, are at the original rate fixed in 1844—namely, 3s., to cover a visit to the works, a visit to the patient and the report, with mileage as above.

Certificates under the Workmen's Compensation Act.—For examination and certificate 5s., with an extra 1s. for each mile or part travelled when the patient is visited. If an examination of the case has already been made under the Factory Act the fee is 1s. only, which, of course, means that the surgeon draws less for a double duty than for certifying under the Compensation Act alone. The fee is to be paid by the workman, but the employer frequently takes up this obligation.

When a vacancy occurs application should be made to the Chief Inspector of Factories, Home Office, Whitehall, London, S.W.1.

INCOME TAX.

"O. K. M." served with the Defence Force in 1921, as a result of which his civil income was reduced by £132, £42 through payment of fees to a locumtenent *plus* £90 lost through inability to attend pensions boards. What can he claim for this loss?

*** The payment of £42 can be charged as a professional expense, but as regards the loss through reduction of earnings no claim can be made; it is, of course, only the reduced amount of the earnings which count as receipts. Tax is legally due on the amount of the Defence Force pay.

"R. M. S." has this year been refused a deduction for the cost of purchasing medical textbooks and of subscribing to medical societies.

*** As we have often said before, we consider that expenses incurred in maintaining, as distinct from improving, a medical library are allowable as necessarily incurred in the performance of the duties of the office. We fail to see any distinction in principle between the expense incurred in maintaining, for example, a set of instruments in proper condition, with the cost of keeping up to a proper level the stock of professional knowledge.

"W. B." is in general practice and holds an appointment as administrator of a hospital. He has been refused a deduction for the expense of travelling between his professional premises and the hospital.

*** Some years ago the Board of Inland Revenue agreed that a hospital appointment need not be separately dealt with—that is, that a single assessment be made under Schedule D on the full earnings of the practice *plus* the appointment. We have not heard that this arrangement has been terminated, and assuming that it continues, "W. B." should apparently be assessed in one sum for all his earnings, in which case the expense is allowable as the case quoted refers only to an assessment under Schedule E.

"O. Y." asks: Has an inspector of taxes any right to demand the inspection of a bank pass book?

*** No. We must, however, add that if an assessment is made against which the taxpayer appeals, the Commissioners by whom the appeal is to be heard can require production of such evidence as they think fit, and confirm the assessment if this is not forthcoming.

LETTERS, NOTES, ETC.

GASTRO-JEJUNOSTOMY FOR PERFORATED GASTRIC AND DUODENAL ULCERS.

SIR JOHN O'CONOR, K.B.E., M.D. (Senior Medical Officer, British Hospital, Buenos Aires) writes: May I beg to mention that personal (including some bitter) experience convinced me some years ago that, on this side of the Atlantic, the operation for closure of the perforation does not cure the ulcer, and compelled me to adopt the following plan of treatment: Close the perforation, keep the patient in bed for one month, on milk; then perform gastro-jejunostomy, repeat the rest in bed on milk diet (with or without an egg nog once or twice daily) for another thirty days, and follow by careful "gradual" feeding for one year. It is my profound belief that if, in cases of ulcer treated

by gastro-jejunostomy, one were to adhere to one month's rest of stomach and body and follow this by intelligent feeding for one year, we should hear nowadays much more about the virtues of gastro-enterostomy and a great deal less about the necessity for gastrectomy, which, by the way, produces another sore, which has to be dealt with by the natural factors of repair, and which I find sometimes passes into a condition of chronic ulceration, ending up also in cancer. The fact must not be ignored that the human cells have got to do the healing; given the general feeble power of cellular restitution which obviously must exist in everyone who has a chronic ulcer of the stomach, is there any reason to assume that the chances (omitting shock following operation) of cure are enhanced by the substitution of a huge acute wound for a smaller chronic one, which at one time originated in a small acute lesion? I do not wish it to be inferred that, in some instances—particularly ulcers attended with a mass of chronic induration which in all probability is beyond the power of natural resolution, I advocate gastro-jejunostomy in preference to gastrectomy; I maintain that in cases where the latter is essential the former should be added so as to ensure an after-treatment which will correspond to the natural law of repair.

SPA TREATMENT FOR PHLEBITIS.

DR. CHARLES BOYCE (London, S.W.) writes with reference to the treatment of phlebitis and other venous ailments to draw attention to the benefit that may be derived from the thermal waters of Bagnoles de l'Orne, in Normandy, where a spa establishment was founded in 1718. The waters contain carbonic acid, silica, and salts of iron, calcium, magnesium, potassium, sodium and lithium, and are radio-active. They have gained considerable renown on the Continent in the treatment not only of venous diseases, but of gynaecological conditions, rheumatism, diseases of nutrition, and skin diseases. During the great war a large number of officers and men were successfully treated there for varix, ulcers, and the after-effects of phlebitis. Dr. Boyce has had personal experience of the efficacy of the waters in the treatment of phlebitis. He recently completed a cure for recurrent attacks of phlebitis in the leg; as a result he has abandoned the use of stocking or bandage and the discoloration and pain have disappeared, although the leg still swells considerably after walking. Bagnoles is best reached via Paris (Gare des Invalides), from which it is five hours' journey; there are through carriages during the season (mid-May to end of September).

FETID EXPECTORATION.

FROM time to time correspondents write to call the attention of the profession to the value of garlic in bronchitis, especially when accompanied by fetid expectoration. Recently we have had a note from Dr. Vallabhdas N. Mehta, L.M. and S. (Viramgam, Bombay Presidency), who states that in a case in which there was a slight elevation of temperature and the expectoration was horribly fetid, he gave injections of garlic oil daily for twelve days. A great improvement ensued, and the fever completely disappeared. The patient was advised to include garlic in his diet for the future. The dose used is not stated.

ALUMINIUM COOKING VESSELS.

IN reply to a correspondent, we stated on August 19th, p. 332, that aluminium is the best metal next to gold or platinum for culinary utensils, and was better than silver. The reference to gold and platinum seems to have caused some amusement, but in answering a chemical inquiry it seemed better to give the exact facts. Dr. Gower Gardner (Oxford) now asks about the action of alkalis on aluminium, as he has heard that an alkali such as washing soda quickly "corrodes" aluminium. He also states that an objection to aluminium is its liability to turn black when used for boiling milk.

*** It is true that aluminium suffers corrosion in the presence of alkalis, and the effect on cabbages and green vegetables cooked in aluminium vessels may therefore have some theoretical interest since it is usual to add sodium carbonate or bicarbonate to the water in which they are boiled. The rate of action on the metal depends on the alkalinity of the liquid; with caustic alkalis it is rapid; with carbonates much less rapid, and with diminishing concentration of the alkali it is further retarded; at the dilution in which alkaline taste ceases to be apparent there is no perceptible effect. Under ordinary conditions small traces of aluminium will pass into solution in the form of aluminium hydroxide and this will be taken with the food *pari passu* with the soda, in quantity approximating to, at most, a few hundredths of the amount of soda. In other words, the total effect would be equivalent to increasing by about double, the proportion of aluminium hydroxide already existing from natural sources in the water in which the vegetables are cooked. The statement that aluminium vessels are liable to turn black when used for boiling milk would appear to be founded on exceptional experience. No other report of this effect has been heard of in the course of our inquiries. The following is, however, a possible explanation: if any film of a spongy nature, such as oxidized metal or milk protein from a previous boiling, is left on the inner surface of the vessel, a new addition of milk being absorbed by the film would be subjected to superheating; the milk thus scorched within the film would produce a black stain.

HERPES WITH FACIAL PARALYSIS.

DR. J. F. GORDON (Maghull, Liverpool) submits brief notes of the following case as a possible basis for discussion: About a week ago (he writes) I was sent for to see a patient, a male aged 72, suffering from herpes of the suboccipital and facial regions. The case was a typical one, eruption very pronounced and profuse, the neural pain intense. I prescribed the treatment usually adopted in such cases: locally powder, covered with gamgee, an anodyne and sedative mixture to combat the pain and insomnia. I saw my patient again on Sunday last. His wife, with whom I had a conversation while he was being sent for (as he had gone out for a walk), informed me that he had two nights' good sleep and was now practically free from pain. She said that in every respect he was right, save that the intensity of the pain during its severity must have twisted his face crooked! On his arrival I at once saw he had typical facial paralysis. I have had many cases of herpes in a long professional experience (several over the areas involved in the present case), but never one with facial paralysis coincident with the eruption. Regarding as one does the neuritis (which almost invariably accompanies a case of shingles), as also the eruption (which is coincident with or follows soon after the neural pain), as usual conditions which are looked for, and admitting that a neuritis may be followed by paralysis over the area affected, is the coincident occurrence of the eruption and facial paralysis not somewhat unusual?

THE PERUVIAN ANDES.

SEÑOR OSCAR VICTOR SALOMÓN, Consul-General for Peru, writes to us objecting to a sentence in the brief report (JOURNAL, June 17th, 1922, p. 966), of a lecture delivered by Mr. Joseph Barcroft, F.R.S., at the Royal Institution, on the physiological effects at high altitudes observed during the recent expedition to Peru. Speaking of some customs of the inhabitants of the Andes, Mr. Barcroft is reported to have said:

> "When a native was very ill, for instance, the date of his funeral was fixed without reference to his convenience, and an official saw to it that he was ready to keep the appointment!"

Señor Salomón expresses surprise at the repetition of this piece of hearsay by an eminent man of science, and suggests that the story might have been verified by consulting the authorities of the Peruvian Government on the spot. After a tribute to the exhilarating climate of the Sierra slopes, our correspondent concludes:

> "I am in a position, in all matters relating to the Cordilleras of Peru, to speak from the vantage point of six years of travel through their entire length and breadth, and not, as in Professor Barcroft's case, from a mere two weeks' sojourn among vast mountain chains which, together with their denizens, demand long acquaintance before the traveller can speak with the infallible voice of fact."

Señor Salomón acknowledges that his letter is based on an extract from our report published elsewhere. The sentence, as printed by us, ended with a note of exclamation, suggesting that the lecturer did not mean his anecdote to be taken too seriously.

A BY-PRODUCT OF THE JAMAICA HOOKWORM CAMPAIGN.

AN official gazette is one of the less likely places to find humour, and the following letter, printed in the report of the Jamaica Hookworm Commission in the *Jamaica Gazette* for June 22nd, 1922, deserves wider publicity:

> "Dear Doctor, I James Tucker who being one of your patient I dear say I congratulate you for your attendance and your good service for I am able to say that I take your treatment four time and since I Began to take the treatment I feel Strong and Healthy. Your annal Service had make me Pleasant and Good. Before your treatment all Different Bad feelings Darkness of eyes Headach gue diness and Several Felling which is not good. But thank God for the Medical Service which the Government give us and I never neglect by taking it. And it dun a good for me. Please doctor Respected Sir, when taking the treatment it comes very simple to me but now I feel quite Amusing to myself and am able to eat and drink very Haughty now all bad feeling is scatter away. Dear Doctor I am your Sincare Patient."

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 28, 29, 32, 33, and 34 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 30, 31, and 32.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *112*.

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NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.